INCH-POUND

MIL-DTL-3965/24B
19 August 2002
SUPERSEDING
MIL-C-3965/24A
26 August 1970

DETAIL SPECIFICATION SHEET

CAPACITORS, FIXED, ELECTROLYTIC (NONSOLID ELECTROLYTE), TANTALUM, (POLARIZED, SINTERED SLUG) - 85°C (VOLTAGE DERATED TO 125°C), STYLES CL66 AND CL67

INACTIVE FOR NEW EQUIPMENT DESIGN
NO SUPERSEDING DOCUMENT

This specification is approved for use to the Departments and Agencies of the Department of Defense.

The requirements for acquiring the product described herein shall consist of this specification and MIL-DTL-3965.

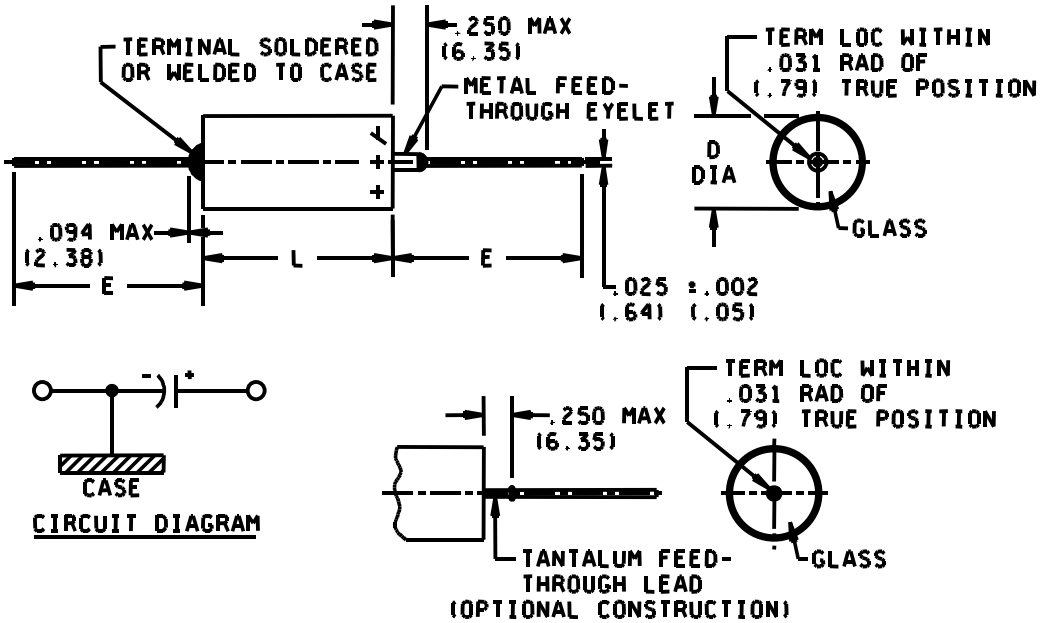

FIGURE 1. Styles CL66 and CL67 capacitors.

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

Case size	Dimensions			
	L 1/	D		E
	+.031 (0.79) -.016 (0.41)	±.016 (0.41) (CL66)	Max (CL67)	±.250 (6.35)
T1	.453 (11.51)	.188 (4.78)	.219 (5.56)	1.500 (38.10)
T2	.641 (16.28)	.281 (7.14)	.312 (7.92)	2.250 (57.15)
T3	.766 (19.46)	.375 (9.53)	.406 (10.31)	2.250 (57.15)

1/ For style CL67, nonshrinkable sleeving shall extend .016 inch minimum, .062 inch maximum, beyond each end of the case; shrinkage sleeving shall lap over the ends of the case.

NOTES:
1. Dimensions are in inches.
2. Millimeters are in parentheses.
3. Metric equivalents (to the nearest .01 mm) are given for general information only and are based upon 1 inch = 25.4 mm.

FIGURE 1. Styles CL66 and CL67 capacitors – Continued.

TABLE I. Capacitor characteristics.

PIN 1/	Voltage			Capac-tance 2/	Cap. toler-ance	DC leakage (max)		Dissi-pation factor (max)	Imped-ance (max)	Capacitance change			Case size
	Rated (+85°C)	Derated (+125°C)	Surge (+85°C)			+25°C	+85°C & +125°C			-55°C	+85°C	+125°C	
	volts, dc	volts, dc	volts,dc	µF		µA	µA	%	ohms	%	%	%	
CL6-BB300-PG	6	4	6.9	30.0	J,K,M	1	2	9.1	100	-40	+10.5	+12	T1
CL6-BB680-PG	6	4	6.9	68.0*	J,K,M	1	2	20.4	60	-40	+14	+16	T1
CL6-BB141-PG	6	4	6.9	140.0	J,K,M	1	3	21.3	40	-40	+14	+16	T2
CL6-BB271-PG	6	4	6.9	270.0*	J,K,M	1	7	81.8	25	-44	+17.5	+20	T2
CL6-BB331-PG	6	4	6.9	330.0	J,K,M	2	8	49.6	20	-44	+14	+16	T3
CL6-BB561-PG	6	4	6.9	560.0*	J,K,M	2	13	128.0	25	-64	+17.5	+20	T3
CL6-BC250-PG	8	5	9.2	25.0	J,K,M	1	2	7.6	100	-40	+10.5	+12	T1
CL6-BC560-PG	8	5	9.2	56.0*	J,K,M	1	2	17.0	59	-40	+14	+16	T1
CL6-BC221-PG	8	5	9.2	220.0*	J,K,M	1	7	66.4	30	-44	+17.5	+20	T2
CL6-BC431-PG	8	5	9.2	430.0*	J,K,M	2	14	91.5	25	-64	+17.5	+20	T3
CL6-BD200-PG	10	7	11.5	20.0	J,K,M	1	2	6.1	175	-32	+10.5	+12	T1
CL6-BD470-PG	10	7	11.5	47.0*	J,K,M	1	2	18.1	100	-36	+14	+16	T1
CL6-BD101-PG	10	7	11.5	100.0	J,K,M	1	4	15.2	60	-36	+14	+16	T2
CL6-BD181-PG	10	7	11.5	180.0*	J,K,M	1	7	54.4	40	-36	+14	+16	T2
CL6-BD251-PG	10	7	11.5	250.0	J,K,M	2	10	37.8	30	-40	+14	+16	T3
CL6-BD391-PG	10	7	11.5	390.0*	J,K,M	2	16	87.6	25	-64	+17.5	+20	T3
CL6-BE150-PG	15	10	17.2	15.0	J,K,M	1	2	5.7	155	-24	+10.5	+12	T1
CL6-BE330-PG	15	10	17.2	33.0*	J,K,M	1	2	12.5	90	-28	+14	+16	T1
CL6-BE700-PG	15	10	17.2	70.0	J,K,M	1	4	13.1	75	-28	+14	+16	T2
CL6-BE121-PG	15	10	17.2	120.0*	J,K,M	1	7	36.8	50	-28	+17.5	+20	T2
CL6-BE171-PG	15	10	17.2	170.0	J,K,M	2	10	25.4	35	-32	+14	+16	T3
CL6-BE271-PG	15	10	17.2	270.0*	J,K,M	2	16	60.9	30	-56	+17.5	+20	T3
CL6-BG100-PG	25	15	28.8	10.0	J,K,M	1	2	4.6	220	-16	+8	+9	T1
CL6-BG220-PG	25	15	28.8	22.0*	J,K,M	1	2	8.3	140	-20	+10.5	+12	T1
CL6-BG101-PG	25	15	28.8	100.0*	J,K,M	1	10	31.4	50	-28	+13	+15	T2
CL6-BG181-PG	25	15	28.8	180.0*	J,K,M	2	18	54.3	32	-48	+13	+15	T3

See footnotes at end of table.

TABLE I. Capacitor characteristics – Continued.

PIN 1/	Voltage			Capacitance 2/	Cap. tolerance	DC leakage (max)		Dissipation factor (max)	Impedance (max)	Capacitance change			Case size
	Rated (+85°C)	Derated (+125°C)	Surge (+85°C)			+25°C	+85°C & +125°C			-55°C	+85°C	+125°C	
	volts, dc	volts, dc	volts,dc	µF		µA	µA	%	ohms	%	%	%	
CL6-BH080-PG	30	20	34.5	8.0	J,K,M	1	2	4.5	275	-16	+8	+12	T1
CL6-BH150-PG	30	20	34.5	15.0*	J,K,M	1	2	9.1	175	-20	+10.5	+12	T1
CL6-BH400-PG	30	20	34.5	40.0	J,K,M	1	5	12.2	65	-24	+10.5	+12	T2
CL6-BH680-PG	30	20	34.5	68.0*	J,K,M	1	8	31.0	60	-24	+13	+15	T2
CL6-BH101-PG	30	20	34.5	100.0	J,K,M	2	12	19.0	40	-28	+10.5	+12	T3
CL6-BH151-PG	30	20	34.5	150.0*	J,K,M	2	18	46.0	35	-48	+13	+15	T3
CL6-BJ050-PG	50	30	57.5	5.0	J,K,M	1	2	3.4	400	-16	+5	+6	T1
CL6-BJ100-PG	50	30	57.5	10.0*	J,K,M	1	2	6.0	250	-24	+8	+9	T1
CL6-BJ250-PG	50	30	57.5	25.0	J,K,M	1	5	11.2	95	-20	+10.5	+12	T2
CL6-BJ470-PG	50	30	57.5	47.0*	J,K,M	1	9	21.4	70	-28	+13	+15	T2
CL6-BJ600-PG	50	30	57.5	60.0	J,K,M	2	12	13.6	45	-16	+10.5	+12	T3
CL6-BJ820-PG	50	30	57.5	82.0*	J,K,M	2	16	24.9	45	-32	+13	+15	T3
CL6-BK040-PG	60	40	69.0	4.0	J,K,M	1	2	3.0	550	-16	+5	+6	T1
CL6-BK8R2-PG	60	40	69.0	8.2*	J,K,M	1	2	5.0	275	-24	+8	+9	T1
CL6-BK200-PG	60	40	69.0	20.0	J,K,M	1	5	7.6	105	-16	+10.5	+12	T2
CL6-BK390-PG	60	40	69.0	39.0*	J,K,M	1	9	20.7	90	-28	+10.5	+12	T2
CL6-BK500-PG	60	40	69.0	50.0	J,K,M	2	12	15.3	50	-16	+10.5	+12	T3
CL6-BK680-PG	60	40	69.0	68.0*	J,K,M	2	16	20.7	50	-32	+10.5	+12	T3
CL6-BL3R5-PG	75	50	86.2	3.5	J,K,M	1	2	2.5	650	-16	+5	+6	T1
CL6-BL6R8-PG	75	50	86.2	6.8*	J,K,M	1	2	4.1	300	-20	+8	+9	T1
CL6-BL150-PG	75	50	86.2	15.0	J,K,M	1	5	7.5	150	-16	+8	+9	T2
CL6-BL330-PG	75	50	86.2	33.0*	J,K,M	1	10	17.5	90	-24	+10.5	+15	T2
CL6-BL400-PG	75	50	86.2	40.0	J,K,M	2	12	15.2	60	-16	+10.5	+12	T3
CL6-BL560-PG	75	50	86.2	56.0*	J,K,M	2	17	26.0	60	-28	+10.5	+15	T3

See footnotes at end of table.

TABLE I. Capacitor characteristics – Continued.

PIN 1/	Voltage			Capac-tance 2/	Cap. toler-ance	DC leakage (max)		Dissi-pation factor (max)	Imped-ance (max)	Capacitance change			Case size
	Rated (+85°C)	Derated (+125°C)	Surge (+85°C)			+25°C	+85°C & +125°C			-55°C	+85°C	+125°C	
	volts, dc	volts,dc	volts,dc	µF		µA	µA	%	ohms	%	%	%	
CL6-BN2R5-PG	100	65	115.0	2.5	J,K,M	1	2	5.0	950	-16	+7	+8	T1
CL6-BN4R7-PG	100	65	115.0	4.7*	J,K,M	1	2	3.6	500	-16	+7	+8	T1
CL6-BN110-PG	100	65	115.0	11.0	J,K,M	1	4	5.0	200	-16	+7	+8	T2
CL6-BN220-PG	100	65	115.0	22.0*	J,K,M	1	9	11.8	100	-16	+7	+8	T2
CL6-BN300-PG	100	65	115.0	30.0	J,K,M	2	12	9.1	80	-16	+7	+8	T3
CL6-BN430-PG	100	65	115.0	43.0*	J,K,M	2	17	19.7	70	-20	+7	+8	T3
CL6-BP1R7-PG	125	85	144.0	1.7	J,K,M	1	2	7.0	1,250	-16	+7	+8	T1
CL6-BP3R6-PG	125	85	144.0	3.6*	J,K,M	1	2	4.1	600	-16	+7	+8	T1
CL6-BP090-PG	125	85	144.0	9.0	J,K,M	1	5	10.2	240	-16	+7	+8	T2
CL6-BP140-PG	125	85	144.0	14.0*	J,K,M	1	7	12.7	167	-16	+7	+8	T2
CL6-BP250-PG	125	85	144.0	25.0*	J,K,M	2	13	19.0	93	-16	+7	+8	T3

1/ Complete type designation will include additional symbols to indicate style and capacitance tolerance.
2/ The asterisk (*) indicates high-capacitance series.

TABLE II. Cross-reference data.

From	To	From	To
PIN 1/ MIL-DTL-3965/24	PIN 2/ MIL-PRF-39006/9	PIN 1/ MIL-DTL-3965/24	PIN 2/ MIL-PRF-39006/9
	M39006/09-		M39006/09-
CL6-BB300MPG	8001	CL6-BD181MPG	8044
CL6-BB300KPG	8002	CL6-BD181KPG	8045
CL6-BB300JPG	8003	CL6-BD181JPG	8046
CL6-BB680MPG	8004	CL6-BD251MPG	8047
CL6-BB680KPG	8005	CL6-BD251KPG	8048
CL6-BB680JPG	8006	CL6-BD251JPG	8049
CL6-BB141MPG	8007	CL6-BD391MPG	8050
CL6-BB141KPG	8008	CL6-BD391KPG	8051
CL6-BB141JPG	8009	CL6-BD391JPG	8052
CL6-BB271MPG	8010	CL6-BE150MPG	8055
CL6-BB271KPG	8011	CL6-BE150KPG	8056
CL6-BB271JPG	8012	CL6-BE150JPG	8057
CL6-BB331MPG	8013	CL6-BE330MPG	8058
CL6-BB331KPG	8014	CL6-BE330KPG	8059
CL6-BB331JPG	8015	CL6-BE330JPG	8060
CL6-BB561MPG	8016	CL6-BE700MPG	8061
CL6-BB561KPG	8017	CL6-BE700KPG	8062
CL6-BB561JPG	8018	CL6-BE700JPG	8063
CL6-BC250MPG	8021	CL6-BE121MPG	8064
CL6-BC250KPG	8022	CL6-BE121KPG	8065
CL6-BC250JPG	8023	CL6-BE121JPG	8066
CL6-BC560MPG	8024	CL6-BE171MPG	8067
CL6-BC560KPG	8025	CL6-BE171KPG	8068
CL6-BC560JPG	8026	CL6-BE171JPG	8069
CL6-BC221MPG	8027	CL6-BE271MPG	8070
CL6-BC221KPG	8028	CL6-BE271KPG	8071
CL6-BC221JPG	8029	CL6-BE271JPG	8072
CL6-BC431MPG	8030	CL6-BG100MPG	8075
CL6-BC431KPG	8031	CL6-BG100KPG	8076
CL6-BC431JPG	8032	CL6-BG100JPG	8077
CL6-BD200MPG	8035	CL6-BG220MPG	8078
CL6-BD200KPG	8036	CL6-BG220KPG	8079
CL6-BD200JPG	8037	CL6-BG220JPG	8080
CL6-BD470MPG	8038	CL6-BG101MPG	8081
CL6-BD470KPG	8039	CL6-BG101KPG	8082
CL6-BD470JPG	8040	CL6-BG101JPG	8083
CL6-BD101MPG	8041	CL6-BG181MPG	8084
CL6-BD101KPG	8042	CL6-BG181KPG	8085
CL6-BD101JPG	8043	CL6-BG181JPG	8086

See footnotes at end of table.

TABLE II. Cross-reference data – Continued.

From	To	From	To
PIN 1/ MIL-DTL-3965/24	PIN 2/ MIL-PRF-39006/9	PIN 1/ MIL-DTL-3965/24	PIN 2/ MIL-PRF-39006/9
	M39006/09-		M39006/09-
CL6-BH080MPG	8089	CL6-BK8R2MPG	8132
CL6-BH080KPG	8090	CL6-BK8R2KPG	8133
CL6-BH080JPG	8091	CL6-BK8R2JPG	8134
CL6-BH150MPG	8092	CL6-BK200MPG	8135
CL6-BH150KPG	8093	CL6-BK200KPG	8136
CL6-BH150JPG	8094	CL6-BK200JPG	8137
CL6-BH400MPG	8095	CL6-BK390MPG	8138
CL6-BH400KPG	8096	CL6-BK390KPG	8139
CL6-BH400JPG	8097	CL6-BK390JPG	8140
CL6-BH680MPG	8098	CL6-BK500MPG	8141
CL6-BH680KPG	8099	CL6-BK500KPG	8142
CL6-BH680JPG	8100	CL6-BK500JPG	8143
CL6-BH101MPG	8101	CL6-BK680MPG	8144
CL6-BH101KPG	8102	CL6-BK680KPG	8145
CL6-BH101JPG	8103	CL6-BK680JPG	8146
CL6-BH151MPG	8104	CL6-BL3R5MPG	8149
CL6-BH151KPG	8105	CL6-BL3R5KPG	8150
CL6-BH151JPG	8106	CL6-BL3R5JPG	8151
CL6-BJ050MPG	8109	CL6-BL6R8MPG	8152
CL6-BJ050KPG	8110	CL6-BL6R8KPG	8153
CL6-BJ050JPG	8111	CL6-BL6R8JPG	8154
CL6-BJ100MPG	8112	CL6-BL150MPG	8155
CL6-BJ100KPG	8113	CL6-BL150KPG	8156
CL6-BJ100JPG	8114	CL6-BL150JPG	8157
CL6-BJ250MPG	8115	CL6-BL330MPG	8158
CL6-BJ250KPG	8116	CL6-BL330KPG	8159
CL6-BJ250JPG	8117	CL6-BL330JPG	8160
CL6-BJ470MPG	8118	CL6-BL400MPG	8161
CL6-BJ470KPG	8119	CL6-BL400KPG	8162
CL6-BJ470JPG	8120	CL6-BL400JPG	8163
CL6-BJ600MPG	8121	CL6-BL560MPG	8164
CL6-BJ600KPG	8122	CL6-BL560KPG	8165
CL6-BJ600JPG	8123	CL6-BL560JPG	8166
CL6-BJ820MPG	8124	CL6-BN2R5MPG	8169
CL6-BJ820KPG	8125	CL6-BN2R5KPG	8170
CL6-BJ820JPG	8126	CL6-BN2R5JPG	8171
CL6-BK040MPG	8129	CL6-BN4R7MPG	8172
CL6-BK040KPG	8130	CL6-BN4R7KPG	8173
CL6-BK040JPG	8131	CL6-BN4R7JPG	8174

See footnotes at end of table.

TABLE II. Cross-reference data – Continued.

From	To
PIN 1/ MIL-DTL-3965/24	PIN 2/ MIL-PRF-39006/9
	M39006/09-
CL6-BN110MPG	8175
CL6-BN110KPG	8176
CL6-BN110JPG	8177
CL6-BN220MPG	8178
CL6-BN220KPG	8179
CL6-BN220JPG	8180
CL6-BN300MPG	8181
CL6-BN300KPG	8182
CL6-BN300JPG	8183
CL6-BN430MPG	8184
CL6-BN430KPG	8185
CL6-BN430JPG	8186
CL6-BP1R7MPG	8189
CL6-BP1R7KPG	8190
CL6-BP1R7JPG	8191
CL6-BP3R6MPG	8192
CL6-BP3R6KPG	8193
CL6-BP3R6JPG	8194
CL6-BP090MPG	8195
CL6-BP090KPG	8196
CL6-BP090JPG	8197
CL6-BP140MPG	8198
CL6-BP140KPG	8199
CL6-BP140JPG	8200
CL6-BP250MPG	8201
CL6-BP250KPG	8202
CL6-BP250JPG	8203

1/ Complete PIN will include additional symbol to indicate style.
2/ PIN referenced will substitute for styles CL66 and CL67.

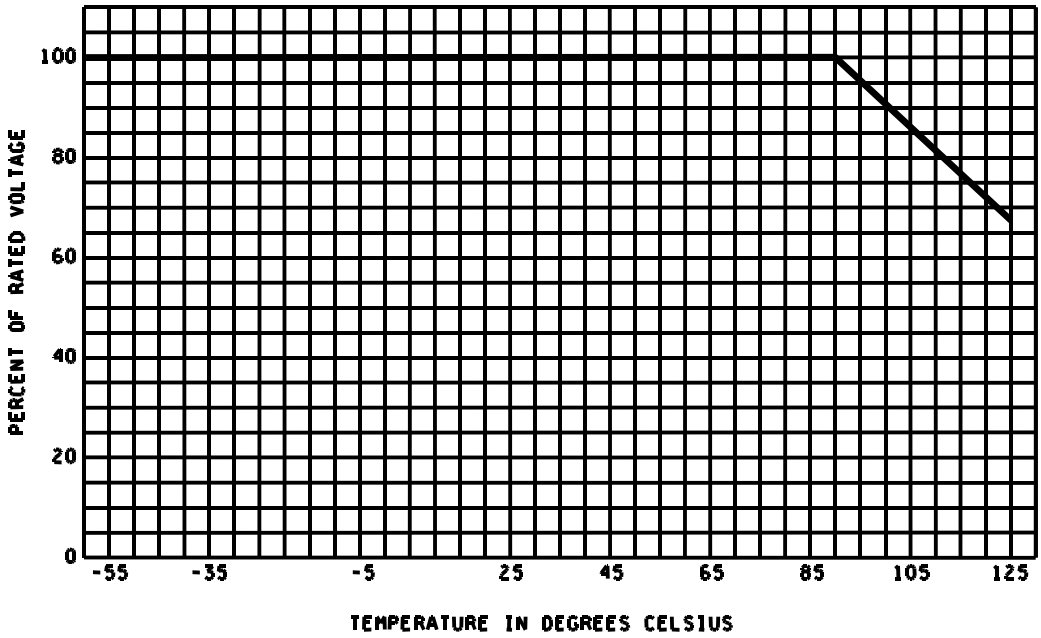

FIGURE 2. Voltage derating with temperature.

REQUIREMENTS:

Design and construction:

Dimensions and configuration: See figure 1.

Case type: Tubular; uninsulated (CL66), insulated (CL67).

Seal type: Hermetic (symbol G).

Terminals: Axial wire-lead.

Rated temperature: -55°C to +85°C, voltage derated to ±125°C (see figure 2).

Rated voltage: See table I.

Capacitance (cap) (nom): See table I.

Capacitance tolerance: Symbol J (± 5 percent), K (± 10 percent), or M (± 20 percent).

DC leakage (DCL) (max) (at +25°C): See table I.

Dissipation factor (DF) (max): See table I.

Seal: In accordance with MIL-DTL-3965.

Dielectric withstanding voltage (DWV):

Sleeving to case (min): 2,000 V dc.

Terminal to case: Not applicable.

Insulation resistance:

Sleeving to case (min): 100 megohms.

Terminal to case: Not applicable.

Temperature cycling:

DCL (max): 125 percent of 25°C value of table I.

ΔCap.: Within $\pm$ 5 percent of initial measurement.

DF (max): 115 percent of table I value.

Solderability: In accordance with MIL-DTL-3965.

Terminal strength:

Pull test: In accordance with MIL-DTL-3965.

Bend test: Not applicable.

Torque test: Not applicable.

Wire-lead bend test: In accordance with MIL-DTL-3965.

Twist test: Not applicable.

Surge voltage: See table I.

Moisture resistance:

DCL (max): 125 percent of 25°C value of table I.

ΔCap.: Within $\pm$ 8 percent of initial measurement.

DF (max): 115 percent of table I value.

Low temperature (storage):

DCL (max): See table I (25°C).

ΔCap.: Within ± 5 percent of initial measurement.

DF (max): See table I.

Stability at low and high temperature:

Step 1 (+25°C):

DCL (max): See table I.

Cap.: Within tolerance of table I value.

DF (max): See table I.

Step 2 (-55°C):

Impedance: See table I.

ΔCap. (max): See table I.

Step 3 (+25°C):

DCL (max): See table I.

ΔCap.: Within ±5 percent of step 1 value.

DF (max): See table I.

Step 4(+85°C):

DCL (max): See table I.

ΔCap (max): See table I.

DF (max): See table I.

Step 5 (+125°C):

DCL (max): See table I.

ΔCap. (max): See table I.

DF (max): See table I.

Step 6 (+25°C):

DCL (max): See table I.

ΔCap.: Within ±5 percent of initial measurement.

DF (max): See table I.

Life at +85°C:

2,000-hr (qualification):

DCL (max): See table I (25°C).

ΔCap.: Within ±10 percent of initial measurement.

DF (max): See table I (25°C).

240-hour (group B):

DCL (max): See table I (25°C).

ΔCap.: Within ±10 percent of initial measurement.

DF (max): See table I (25°C).

760-hour (group C):

DCL (max): See table I (25°C).

ΔCap.: Within ±10 percent of initial measurement.

DF (max): See table I (25°C).

Barometric pressure:

Test voltage: Rated voltage.

Life at +125°C.

DCL (max): See table I (25°C).

ΔCap.: Within ±10 percent of initial measurement.

DF (max): See table I (25°C).

DWV (min) (CL67 only): 2,000 V dc.

IR (min) (CL67 only): 100 megohms.

Marking (except case size T1): In accordance with MIL-DTL-3965. T1 case size, mark as follows:

EXAMPLE:

CL66BB } - Type designation
300JPG }

12345 - Source code
7015 - Date code and trademark

Polarity: Series of plus (+) symbols encircling positive end (see figure 1).

Voltage groups (85°C rated voltage):

I - - - - - - - - - - 6 to 15 V inclusive
II - - - - - - - - - - - - 25 to 75 V inclusive
III - - - - - - - - - - - - 100 to 125 V

Reverse voltage: Not applicable.

Custodians:
Army – CR
Navy – EC
Air Force – 11
DLA - CC

Preparing activity:
DLA – CC

Project 5910-2160-04