

MILITARY SPECIFICATION

CAPACITORS, FIXED, ELECTROLYTIC (NONSOLID ELECTROLYTE), TANTALUM,
 ESTABLISHED RELIABILITY,
 GENERAL SPECIFICATION FOR

This amendment forms a part of MIL-C-39006D, dated 23 December 1992,
 and is approved for use by all Departments and Agencies of the
 Department of Defense.

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Following 3.5.3.3.2, add:

"3.5.3.4 Tin plated finishes. Tin plating is prohibited as a final finish or as an undercoat. Tin-lead (Sn-Pb) finishes are acceptable provided that the minimum lead content is 3 percent (see 6.12)."

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3.14, title, add: "(for qualification only)".

PAGE 8

3.28, title, add: "(for qualification only)".

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TABLE III, delete in its entirety and substitute the following:

" TABLE III. Group A inspection.

Inspection	Requirement paragraph	Test paragraph	Sampling procedure
<u>Subgroup 1</u>			
Constant voltage conditioning	3.6	4.7.2] 100% inspection
DC leakage	3.7	4.7.3	
Capacitance	3.8	4.7.4	
Dissipation factor	3.9	4.7.5	
Seal, condition A or D (hermetically-sealed styles)	3.10	4.7.6.1	
<u>Subgroup 2 (ppm) 1/</u>			
DC leakage (ppm-2)	3.7	4.7.3] See table IV
Capacitance (ppm-2)	3.8	4.7.4	
Dissipation factor (ppm-2)	3.9	4.7.5	
Mechanical examination (dimensions only) (ppm-3)	3.5	4.7.1	
<u>Subgroup 3</u>			
Solderability	3.15	4.7.11	5 samples 0 failures
<u>Subgroup 4</u>			
Visual examination		4.7.1] 13 samples 0 failures
Material	3.1, 3.4, 3.4.1	4.7.1	
Marking	3.32	4.7.1	
Workmanship	3.33	4.7.1	

1/ Not applicable for styles which are inactive for new design."

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TABLE IV, delete in its entirety and substitute the following:

"TABLE IV. Sampling plans for ppm categories.

Lot size	Sample size	
	ppm-2	ppm-3
1 - 13	100%	100%
14 - 125	100%	13
126 - 150	125	13
151 - 280	125	20
281 - 500	125	29
501 - 1,200	125	34
1,201 - 3,200	125	42
3,201 - 10,000	192	50
10,001 - 35,000	294	60
35,001 - 150,000	294	74
150,001 - 500,000	345	90
500,001 - UP	435	102

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4.6.1.3.3.1, line 1: Delete "Thirteen" and substitute "Five".

4.6.1.3.3.3, delete in its entirety and substitute:

"4.6.1.3.3.3 Disposition of samples. The solderability test is considered a destructive test, and samples submitted to the solderability test shall not be supplied on the contract."

4.6.1.4.1, after the second sentence, add the following: "(NOTE: The manufacturer has the option of using 10 sample units from the subgroup 1 tests for subgroup 2 testing.)"

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TABLE V, delete in its entirety and substitute the following:

"TABLE V. Group B inspection.

Test	Requirement paragraph	Test paragraph	Sampling procedure
<u>Subgroup 1</u> Stability at low and high temperatures <u>1/</u>	3.22	4.7.18	13 samples 0 failures
<u>Subgroup 2</u> Thermal shock	3.13	4.7.9	□ -10 samples <u>3/</u>
Life (10,000-hour at 85°C) <u>2/</u>	3.24.2	4.7.20.2	

1/ For styles CLR79 and CLR81 only. If the manufacturer can demonstrate that this test has been performed five consecutive times with zero failures, the frequency of this test, with the approval of the qualifying activity, can be performed on an annual basis. If the design, material, construction or processing of the part is changed, or if there are any quality problems or failures, the qualifying activity may require resumption of the original test frequency.

2/ Unit hours generated shall be used for FR level computation.

3/ No failures allowed for thermal shock test. Life test failures in accordance with MIL-STD-690."

4.6.1.4.2, line 1, delete "group B" and substitute "group B, subgroup 2".

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4.6.1.4.3.2, delete in its entirety and substitute:

"4.6.1.4.3.2 Subgroup 2. A failure in subgroup 2 shall be considered as a noncompliance in accordance with 4.6.2.1.4."

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TABLE VI, delete in its entirety and substitute the following:

" TABLE VI. Group C inspection.

Test	Requirement paragraph	Test paragraph	Number of sample units to be inspected	Number of failures allowed ^{1/}
<u>Subgroup 1 (every 2 months)</u>				
Seal, condition C (hermetically sealed styles)	3.10	4.7.6.2	12	1
Shock (specified pulse)	3.11	4.7.7		
Vibration, high frequency	3.12	4.7.8		
Random vibration ^{2/}	3.26	4.7.22		
<u>Subgroup 2 (every 2 months)</u>				
Terminal strength ^{3/}	3.16	4.7.12	12	1
Surge voltage ^{3/}	3.17	4.7.13		
Moisture resistance ^{3/}	3.18	4.7.14		
Dielectric withstanding voltage (insulated styles) ^{3/}	3.19	4.7.15		
Insulation resistance (insulated styles) ^{3/}	3.20	4.7.16		
<u>Subgroup 3 (every 2 months)</u>				
Reverse voltage (when specified, see 3.1) ^{3/}	3.23	4.7.19	12	
<u>Subgroup 4 (CLR79 and CLR81 only) (every 12 months)</u>				
AC ripple life at 85°C	3.25	4.7.21	32 ^{4/}	1
<u>Subgroup 5 (every 2 months)</u>				
Low temperature (storage) ^{5/}	3.21	4.7.17	12	1
<u>Subgroup 6 (every 12 months)</u>				
Resistance to solvents ^{5/}	3.30	4.7.26	6	1
Resistance to soldering heat ^{5/}	3.31	4.7.27		
<u>Subgroup 7 (CLR79 and CLR81 only) (every 12 months)</u>				
Thermal shock	3.13	4.7.9	24 ^{6/}	1
<u>Subgroup 8 (every month)</u>				
Thermal shock	3.13	4.7.9	10	0
Life (2,000-hour at 125°C)	3.27.1	4.7.23.1	10	1

^{1/} A sample having one or more defects shall be considered as a single failure.

^{2/} CLR25, CLR27, CLR35, CLR37, CLR71, CLR73, CLR79, and CLR81 "H" designated units only.

^{3/} If the manufacturer can demonstrate that this test has been performed five consecutive times with zero failures, the frequency of this test, with the approval of the qualifying activity, can be performed on an annual basis. If the design, material, construction or processing of the part is changed, or if there are any quality problems or failures, the qualifying activity may require resumption of the original test frequency.

^{4/} Thirty-two units, eight of each case size.

^{5/} If the manufacturer can demonstrate that this test has been performed five consecutive times with zero failures, this test, with the approval of the qualifying activity, can be deleted. The manufacturer, however, shall perform this test every three years after the deletion as part of long term design verification. If the design, material, construction or processing of the part is changed, or if there are any quality problems, the qualifying activity may require resumption of the specified testing. Deletion of testing does not relieve the manufacturer from meeting the test requirements in case of dispute.

^{6/} Twenty-four units, six of each case size."

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4.7.10, title, add: "(for qualification only)".

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4.7.24, title, add: "(for qualification only)".

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Following 6.11, add:

"6.12 Tin plated finishes. Tin plating is prohibited (see 3.5.3.4) because it may result in tin whisker growth. Tin whisker growth could adversely affect the operation of electronic equipment systems. For additional information, see ASTM B545, "Standard Specification for Electrodeposited Coating of Tin."

CONCLUDING MATERIAL

Custodians:

Army - ER
Navy - EC
Air Force - 85
NASA - NA

Preparing activity:
Navy - EC

Agent:
DLA - ES

Review activities:

Army - AR
Navy - AS, MC, OS, SH
Air Force - 19, 99
DLA - ES

(Project 5910-1876)