

INCH-POUND

MIL-C-39003H
AMENDMENT 2
6 August 1993
SUPERSEDING
AMENDMENT 1
7 May 1993

MILITARY SPECIFICATION

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

This amendment forms a part of MIL-C-39003H, dated 20 March 1992,
and is approved for use by all Departments and Agencies of the
Department of Defense.

PAGE 4

3.5.2.1, delete in its entirety and substitute: "3.5.2.1 Solder dip (re-tinning). The capacitor manufacturer or his approved category B distributor may solder dip/re-tin the leads of the capacitors supplied to this specification. The distributor's hot solder dip/re-tinning process shall be the same as the manufacturer's process, which shall be approved by the qualifying activity."

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* Following 3.5.2.1.2, add:

"3.5.2.2 Tin plated finishes. Tin plating is prohibited as a final finish or an undercoat. Tin-lead (Sn-Pb) finishes are acceptable provided that the minimum lead content is three percent (see 6.9)."

* 3.7, title: Delete "(exponential only)".

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* 3.22, Step 5 (+125°C), Capacitance: Delete "±2" and substitute "±12".

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3.29, last paragraph: Delete in its entirety.

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4.4.4.1.2, line 4: Delete "be" and substitute "the".

4.5f, before "The" add "(Exponential only)".

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TABLE VI, Inspection column, Subgroup 2: After "Mechanical examination" add "(physical dimensions only)".

* TABLE VI, Inspection column, Subgroup 2 (PPM) heading, add "2/".

TABLE VI, Subgroup 3: Delete the physical dimensions test and its associated requirement paragraph number.

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TABLE VII, Subgroup 1, Surge current (styles CSR21 and CSR33 only) test: Move this test and its associated requirement and test method paragraph numbers to below the Life (accelerated failure rate) test and its associated requirement and test method paragraph numbers.

* TABLE VII, Inspection column, Subgroup 1, Life (accelerated failure rate), add "1/".

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* TABLE VII, Subgroup 1, add the following: "Voltage aging : 3.7 : 4.7.3 : 100% inspection 3".

TABLE VII, Inspection column, Subgroup 2: After "Mechanical examination" add "(physical dimensions only)".

TABLE VII, Inspection column, Subgroup 2, (PPM) heading, add "1".

TABLE VII, Subgroup 3: Delete the physical dimensions test and its associated requirement paragraph number.

TABLE VII, Inspection column, Subgroup 4 heading: Add "4".

TABLE VII, bottom of table, add the following: "4/ Sampling need only conform to the requirements of 4.6.1.1.1 exponential distribution inspection lot."

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TABLE VIII, delete in its entirety and substitute:

" TABLE VIII. Sampling plans for PPM categories.

Lot size	Sample size	
	PPM-2	PPM-3
1 - 13	100 percent	100 percent
14 - 125	100 percent	13 units
126 - 150	125 units	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

4.6.1.2.3.1, line 2: Delete "13 samples" and substitute "13-piece sample".

4.6.1.2.3.1, line 3: Delete "sample lot" and substitute "sample".

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4.6.2.1.1.1, line 1: Delete "48" and substitute "72".

4.6.2.1.1.1, line 1: Delete "60" and substitute "84".

4.6.2.1.1.1, line 2: Delete "2 months" and substitute "3 months".

4.6.2.1.1.1, line 2: Delete "subgroups 1, 2, 3, and 5 of" and substitute "the subgroups listed in".

* TABLE X, delete in its entirety and substitute:

TABLE X. Group C inspection.

Inspection	Requirement paragraph	Test method paragraph	Number of samples	Number of failures allowed	
<u>Subgroup 1</u>					
Shock (specified pulse) <u>1/</u>	3.14	4.7.10	} 12	} 1 <u>3/</u>	
Vibration, high frequency <u>1/</u>	3.15	4.7.11			
Thermal shock and immersion <u>1/</u>	3.17	4.7.13			
<u>Subgroup 2</u> <u>2/</u>					
Terminal strength	3.19	4.7.15	} 12		
Resistance to solvents	3.26	4.7.22			
Resistance to soldering heat	3.27	4.7.23			
Moisture resistance	3.20	4.7.16			
Sleeving	3.21	4.7.17			
<u>Subgroup 3</u>					
Life (at +125°C) (exponential only)	3.24.2.3	4.7.20.2.2	24		
<u>Subgroup 4</u>					
Ripple current (CSR21 only)	3.28	4.7.24	12	1	
<u>Subgroup 5</u> <u>1/</u>					
Life (at +125°C)	3.24.2.3	4.7.20.2.3	24	1	

- 1/ 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/ If the manufacturer can demonstrate that these tests have been performed five consecutive times with zero failures, these tests, with the approval of the qualifying activity, can be deleted. The manufacturer, however, shall perform these tests 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.
- 3/ This failure shall not be for the shock (specified pulse) or the vibration, high frequency test."

4.6.2.1.1.2: Delete in its entirety.

* 4.7.3, title, delete "(exponential only)".

4.7.4, add new subparagraph c: "c. Magnification: Not applicable."

FIGURE, bottom of figure, add: "FIGURE 4. Major defects-rejectable."

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- * 4.7.10, add new subparagraph c: "c. Measurements before test: dc leakage, capacitance, dissipation factor, and ESR (style CSR21 only) shall meet the requirements of 3.10, 3.11, 3.12, and 3.13 respectively."
- * 4.7.10, reletter present subparagraphs c and d as subparagraphs d and e respectively.

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4.7.20.2.2, title: Add "exponential only".

- * Following 4.7.20.2.2 add:

"4.7.20.2.3 Group C. Capacitors shall be tested as specified in 4.7.20.1."

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- * Following 6.8, add:

" 6.9 Tin plated finishes. Tin plating is prohibited (see 3.5.2.2) 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)".

The margins of this amendment are marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) from the previous amendment were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous amendment.

CONCLUDING MATERIAL

Custodians:
Army - ER
Navy - EC
Air Force - 85

Review activities:
Navy - OS, SH
Air Force - 17, 99
DLA - ES

User activities:
Navy - AS, MC
Air Force - 19

Preparing activity:
Navy - EC

Agent:
DLA - ES

(Project 5910-1862)