

PERFORMANCE SPECIFICATION

CAPACITORS, FIXED, PLASTIC (OR METALLIZED PLASTIC)
 DIELECTRIC, DC OR DC-AC, IN NONMETAL CASES,
 NON-ESTABLISHED AND ESTABLISHED RELIABILITY
 GENERAL SPECIFICATION FOR

This amendment forms a part of MIL-PRF-55514D, dated 9 October 1997, and is approved for use by all Departments and Agencies of the Department of Defense.

1.1, following "+85°C" 3 places, add: "or +105°C, whichever is applicable".

PAGE 2

TABLE II, symbol N, operating temperature range, delete footnote 1 reference.

1.2.1.4, delete and substitute:

"1.2.4 Rated voltage. The rated voltage is identified by a single letter as shown in table III."

PAGE 3

TABLE III, delete and substitute:

"TABLE III. Voltage rating."

Symbol	DC voltage rating at +85°C ^{1/}	Characteristic Q DC voltage rating at +125°C	Characteristic R DC voltage rating at +125°C
A	50	33.3	25
B	100	66.7	50
C	200	133.3	100
D	300	200.0	150
E	400	266.7	200
F	600	400.0	300
G	75	50.0	37.5
H	150	100.0	75
J	25	16.7	12.5
K	250	166.7	125
L	800	533.3	400

^{1/} DC voltage rating for characteristics K and L at +105°C are the same as those at +85°C."

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3.3.2, second sentence, replace "EIA-554" with "EIA-554-1".

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FIGURE 1, X-axis title, replace "FREQUENCY (HERTZ)" with "NOMINAL CAPACITANCE (in μF)".

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4.5, delete last paragraph and substitute:

"In the event that there is no production of a single style device during a maintenance period and the manufacturer is listed for more than one style on the QPL, a report shall be submitted certifying that the manufacturer still has the capabilities and facilities necessary to produce that product. However, the manufacturer shall still maintain the required number of unit hours in the maintenance period using those styles produced in order to remain qualified to the applicable FRL. In the case where the lowest FR for an unproduced style is M, styles need not be manufactured for testing only but the manufacturer must certify that the capability and facilities needed to produce that style are still in place. In the event that units must be built for the purpose of maintaining the required hours, they shall also undergo all required testing prior to being placed on life test. If, during three consecutive reporting periods, there has been no production of a given style, the manufacturer may be required, at the discretion of the qualifying activity, to submit a newly-produced (not from stock) representative product of that style to testing."

4.6.1.2.1, delete first sentence and substitute:

"The manufacturer shall establish and maintain an inspection system to verify that capacitors meet the capacitance, dissipation factor, insulation resistance, dielectric withstanding voltage, equivalent series resistance (when applicable), visual/mechanical, and solderability requirements.

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4.6.1.2.2.1, third sentence, delete "8 percent" and substitute "5 percent".

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TABLE XII, delete and substitute:

*TABLE XII. Group A inspection.

Inspection	Requirement paragraph	Test method paragraph	Sampling procedure
<u>Subgroup 1</u> Burn-in (when specified, see 3.1) Dielectric withstanding voltage Insulation resistance (at +25°C) Capacitance Dissipation factor (at +25°C) Equivalent series resistance (at +25°C) <u>1/</u>	3.8 3.10 3.9 3.12 3.13 3.14	4.8.4 4.8.6 4.8.5 4.8.8 4.8.9 4.8.10	100 percent inspection
<u>Subgroup 2</u> Mechanical examination external (dimensions only) <u>2/</u>	3.4	4.8.1	See table XIII
<u>Subgroup 3</u> Visual inspection: Marking <u>2/ 3/</u>	3.26	4.8.1	13 samples 0 failures
<u>Subgroup 4</u> Insulation resistance (at high operating temperature) Dissipation factor (at high operating temperature) Equivalent series resistance (at high operating temperature) <u>1/</u>	3.9 3.13 3.14	4.8.5 4.8.9 4.8.10	13 samples 0 failures
<u>Subgroup 5</u> <u>4/</u> Solderability	3.20	4.8.16	5 samples 0 failures

1/ For information purposes only.

2/ The manufacturer may request the deletion of the subgroup 2 mechanical examination external test and subgroup 3 visual inspection, provided an in-line or process control system for assessing and assuring the mechanical requirements and visual requirements are met, can be validated, and approved by the qualifying activity. Deletion of this examination and inspection does not relieve the manufacturer from meeting these requirements. If the design, material, construction, or processing of the part is changed or there are any quality problems, the qualifying activity may require resumption of the test.

3/ Marking defects are based on visual inspection and shall be charged only for illegible, incomplete, or incorrect marking. Any subsequent electrical defects shall not be used as a basis for determining marking defects.

4/ The manufacturer may request the deletion of the subgroup 5 solderability test, provided an in-line or process control system for assessing and assuring the solderability of leads can be validated and approved by the qualifying activity. Deletion of the test does not relieve the manufacturer from meeting this test requirement in case of dispute. If the design, material, construction, or processing of the part is changed or there are any quality problems, the qualifying activity may require resumption of the test."

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TABLE XIII, delete and substitute:

***TABLE XIII. Sampling plans for subgroup 2.**

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

4.6.1.2.2.5.1, first sentence, delete "Thirteen" and substitute "Five".

4.6.1.2.2.5.2.b, fourth sentence, delete "Thirteen" and substitute "Five".

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TABLE XIV, delete and substitute the following:

*TABLE XIV. Group B inspection.

Inspection	Requirement paragraph	Test method paragraph	Number of sample units to be inspected	Number of failures allowed ^{1/}
<u>Subgroup 1 (every 3 months)</u>				
Low temperature conditioning and capacitance change with temperature	3.22	4.8.18	6	1
Thermal shock and immersion	3.23	4.8.19		
<u>Subgroup 1A (every month)</u>				
Life (at accelerated conditions)	3.24	4.8.20.2	10 minimum	
<u>Subgroup 1B (every 3 months) ^{2/}</u>				
Life at 125°C (proof test) characteristics Q and R	3.24	4.8.20.3.2	10	1
<u>Subgroup 1C (every 3 months)</u>				
AC conditioning (when specified, see 3.1)	3.21	4.8.17	(see 3.1)	5 percent
<u>Subgroup 2 (every 6 months)</u>				
Resistance to soldering heat ^{3/}	3.15	4.8.11	12	0
Moisture resistance	3.16	4.8.12		
Vibration, high frequency ^{3/}	3.17	4.8.13		
Shock (specified pulse) ^{3/}	3.18	4.8.14		
Terminal strength	3.19	4.8.15		
<u>Subgroup 2A (every 6 months)</u>				
Resistance to solvents	3.6	4.8.2	5	0

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

^{2/} Proof test data is not used in FRL determination.

^{3/} 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."

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4.8.20.1, delete and substitute:

*4.8.20.1 2,000-hour (qualification inspection). Capacitors shall be tested in accordance with method 108 of MIL-STD-202. The following details and exceptions shall apply:

- a. Method of mounting and distance between specimens: Rigidly mounted by the body with a distance of not less than 1-inch separation between units.
- b. Test temperature and tolerance: +85°C +4°C, -0°C for characteristics M, N, Q, and R;
+105°C +4°C, -0°C for characteristics K and L.
- c. Rated operating conditions: Characteristics M, N, Q, and R capacitors shall be at the +85°C dc rated voltage; characteristics K and L capacitors shall be at the +105°C dc rated voltage.
- d. Accelerated operating conditions: Characteristics K, M, and Q capacitors shall be subjected to 140 percent of dc rated voltage; characteristics L, N, and R capacitors shall be subjected to 125 percent of dc rated voltage.
- e. The surge current shall be limited to 1 ampere. When necessary, a suitable current-limiting resistor shall be inserted into the circuit. Means shall be provided to assure that the full required voltage is applied to the capacitor when current-limiting resistors are used. Radiation shall not be used as a means of heating the chamber.
- f. Test condition: F (2,000 hours +72 hours, -0 hour).
- g. Measurements after exposure: Capacitors shall be returned to the inspection conditions specified in 4.3, and shall be visually examined for deformation of body, obliteration of markings, and leakage of filling compound, when applicable. Insulation resistance (at +25°C), capacitance, and dissipation factor (at +25°C), shall then be measured as specified in 4.8.5, 4.8.8, and 4.8.9 respectively."

4.8.20.3.2, delete paragraph title and substitute: "+125°C proof test (characteristics Q and R)."

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

Review activities:
Navy - AS, MC, OS
Air Force - 17, 19, 99
DLA - CC

Preparing activity:
Army - CR

Agent:
DLA - CC

(Project 5910-1976)