INCH-POUND
MIL-C-1238
AMENDMENT 2
9 July 1993
SUPERSEDING
AMENDMENT 1
15 July 1991

MILITARY SPECIFICATION

CAPACITORS, FIXED, CERAMIC DIELECTRIC,
(TEMPERATURE STABLE AND GENERAL PURPOSE), HIGH RELIABILITY,
GENERAL SPECIFICATION FOR

This amendment forms a part of MIL-C-1238, dated 6 August 1990, and is approved for use by all Departments and Agencies of the Department of Defense.

PAGE 5

* 3.4.1, first two sentences, delete in their entirety and substitute: "Capacitors supplied to this specification shall have a minimum dielectric thickness of 0.8 mil for 50 volt rated capacitors or 1 mil for capacitors with ratings above 50 volts, and a maximum dielectric constant of 2400 (see figure 1). Dielectric thickness is the actual measured thickness of the fired ceramic dielectric layer."

PAGE 6

* 3.8, line three: Delete "until rupture and the level recorded".

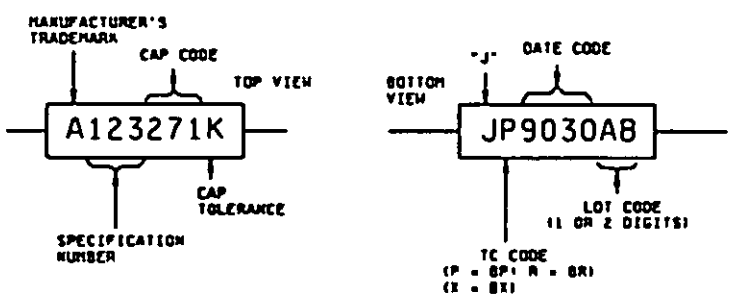
PAGE 7

* 3.15, line two: Delete "of EIA standard RS-469" and substitute "specified herein".

PAGE 13

* FIGURE 3, example 6, delete in its entirety and substitute:

"



Example 6 "

PAGE 16

* 4.3.1, after last sentence, add the following: "All test temperatures above 25°C shall have a tolerance of +4°C, -0°C unless otherwise specified herein."

PAGE 20

* TABLE IX, under visual examination test, add the following test:

"Post termination, unencapsulated destructive physical analysis	3.15	4.6.11	Table XV-1, group I "

PAGE 21

* TABLE X, inspection column, subgroup 1, thermal shock and voltage conditioning, and voltage conditioning at 85°C tests: Add "3/" (two places).

* TABLE X, sampling procedure column, subgroup 3: Delete "XIII" and substitute "XV-1".

* TABLE X, bottom of table, after footnote 2/, add the following:

"3/ The DWV post test is not applicable if optional voltage conditioning was performed at 250 percent or more of the rated voltage."

PAGE 24

* TABLE XIII, title, delete and substitute the following: "Pretermination destructive physical analysis sample size."

PAGE 27

TABLE XV, PDA last 48 hours during voltage conditioning at +125°C heading: Add "1/".

TABLE XV, after table, add the following:

"1/ For optional voltage conditioning, the time required for meeting the PDA shall be calculated with the T(test) PDA equation in 4.6.6.2.2."

4.6.6.2.2, delete in its entirety and substitute the following:

"4.6.6.2.2 Optional voltage conditioning (see 3.10). The manufacturer, with approval from the qualifying activity, may perform an optional voltage conditioning test instead of the standard voltage conditioning test of 4.6.6.2.1. All conditions of 4.6.6.2.1 apply, with the exception of the voltage applied, the test time, and the time required for meeting the PDA. The accelerated condition selected for the optional voltage conditioning shall be used for the duration of the test. At no time shall a combination of standard and optional voltage conditioning be allowed on the same samples. The minimum time duration, T(test) minimum, and the time required for meeting the PDA, T(test) PDA, shall be calculated as follows:

$$T(\text{test})\ \text{minimum} = \frac{1344}{(E\ \text{test}/E\ \text{rated})^3}$$

$$T(\text{test})\ \text{PDA} = \frac{384}{(E\ \text{test}/E\ \text{rated})^3}$$

Where: $2 \times E\ \text{rated} \leq E\ \text{test} \leq 4 \times E\ \text{rated}$
T(test) minimum = Minimum test time in hours
T(test) PDA = Time required for meeting the PDA
E test = Applied voltage
E rated = Rated voltage of the capacitor"

PAGE 29

* 4.6.11, line two, delete in its entirety and substitute: "examined in accordance with table XV-1."

* Following 4.6.11, add the following new table:

"TABLE XV-1. Destructive physical analysis sample size.

Lot size	Minimum sample size 1/	
	Group 1 2/	Group 2 3/
1 - 500	5	3
501 - 10,000	10	4
10,001 - 35,000	25	7
35,001 - 500,000	40	10

1/ No failures allowed.
2/ After lead attachment and before encapsulation, or after removing the encapsulation. Group 1 samples shall be inspected for lead attachment, other assembly-related defects in accordance with appendix A of EIA-469, and the applicable criteria of appendix B of this specification.
3/ Without removing the encapsulation. Group 2 samples shall be inspected in accordance with appendix B of EIA-469 and for the following encapsulation defects:
   a. Voids between the encapsulant and the capacitor body, terminations or lead wires;
   b. Cracks or voids in the encapsulation. There shall be no voids in the encapsulant greater in diameter than 50 percent of the encapsulant wall thickness."

PAGE 31

4.6.15, delete in its entirety and substitute:

"4.6.15 Voltage-temperature limits (see 3.19). The temperature of each capacitor shall be varied as specified in table XVI. Capacitance measurements shall be made at the frequency and voltage specified in 4.6.7. The dc rated voltage need only be applied to the capacitor in each of steps E through G until voltage stability is reached and the capacitance measurement is made. Capacitance measurements shall be made at each step specified in table XVI and at a sufficient number of intermediate points between steps B and G to establish a true characteristic curve. Capacitance measurements at each temperature shall be taken at 5 minute intervals and shall be stopped and recorded when two successive readings indicate a capacitance change of less than one percent."

PAGE 34

* 4.6.19d, delete in its entirety and substitute:

"d. Capacitors shall be subjected to the voltage and circuit specified in 4.6.6.2.1. In the event of a fuse failure, the procedure specified in 4.6.6.2.1 shall apply."

PAGE 50

* 30.2.2d, first sentence, delete and substitute:

"Edge chip-outs shall not be greater in depth than .003 inch (0.08 mm) with respect to either plane."

PAGE 52

* FIGURE C-7, delete in its entirety and substitute:

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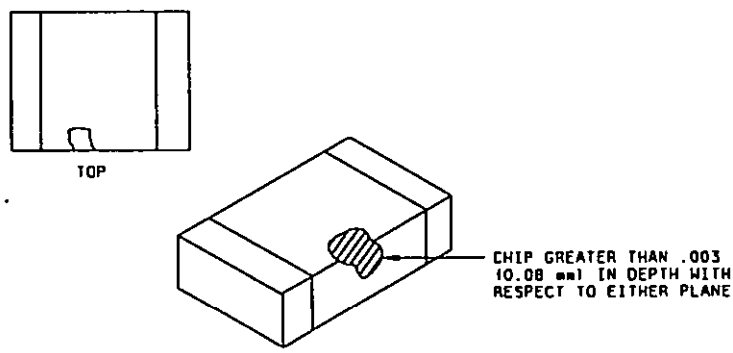

FIGURE C-7. Chip-outs. "

PAGE 55

* 40.1, line three: Delete "until rupture occurs" and substitute "until the limits specified in table XIV are exceeded." Last sentence, delete in its entirety.

* 40.2, delete in its entirety and substitute:

"40.2 Axial devices. Firmly clamp both leads into the test fixture. Gradually apply an increasing force (see figure D-1) until the limits specified in table XIV are exceeded".

* 40.3b, first sentence: Delete "until a rupture occurs" and substitute "until the limits specified in table XIV are exceeded."

* 40.3c: Delete in its entirety.

* FIGURE D-1, delete in its entirety and substitute:

"

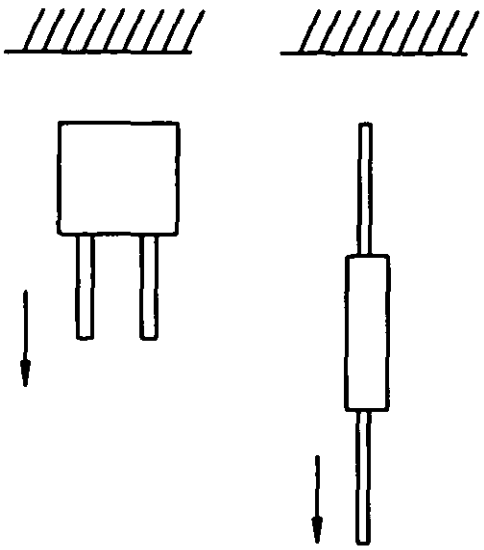

FIGURE D-1. Lead-pull direction."

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:
Air Force - 19
NASA - NA

Review activities:
Army - ER
Navy - EC
Air Force - 85
DLA - ES

Preparing activity:
NASA - NA

Agent:
DLA - ES

(Project 5910-1811)