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NOTICE OF CHANGE

METRIC

MIL-STD-1580B
NOTICE 1
23 April 2003

DEPARTMENT OF DEFENSE

TEST METHOD STANDARD
DESTRUCTIVE PHYSICAL ANALYSIS FOR ELECTRONIC, ELECTROMAGNETIC, AND ELECTROMECHANICAL PARTS

TO ALL HOLDERS OF MIL-STD-1580B:

1. THE FOLLOWING PAGES OF REQUIREMENT 13 OF MIL-STD-1580B HAVE BEEN REVISED AND SUPERSEDE THE PAGES LISTED:

NEW PAGE	DATE	SUPERSEDED PAGE	DATE
1	7 January 2003	1	23 April 2003
2	7 January 2003	2	REPRINTED WITHOUT CHANGE

2. RETAIN THIS NOTICE PAGE AND INSERT BEFORE THE TABLE OF CONTENTS.

3. Holders of MIL-STD-1580B will verify that the changes indicated above have been entered. This notice page will be retained as a check sheet. This issuance, together with appended pages, is a separate publication. Each notice is to be retained by stocking points until the standard is completely revised or cancelled.

4. The margins of this notice are marked with asterisks to indicate where changes 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 issue.

Custodians:
Air Force – 19
NASA - NA
DLA - CC

Preparing activity:
DLA - CC

(Project 59GP-0192)

AMSC N/A

FSC 59GP

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REQUIREMENT 13

DETAILED REQUIREMENTS FOR DIODES

13. General. This section describes detailed requirements for a DPA of commonly used diodes. These requirements supplement the general requirements in section 4. Examples of typical configuration sketches are found in method 2074, MIL-STD-750. When applicable, specification numbers or types are provided to assist in identification. Pre-DPA tests, such as functional tests and solderability tests, are assumed to have been satisfied by normal inspection and testing and are therefore not addressed.

13.1 Diodes, glass bodied, axial leaded and surface mount (MIL-PRF-19500).

13.1.1 Electrical Testing. Perform the appropriate Group A electrical test per the diode slash sheet or source control drawing. As a minimum, the following tests shall be performed.

Signal or Rectifying Diodes
I_R (reverse leakage)
V_F (forward voltage)

Zener Diodes
V_Z (zener voltage)
I_F (forward current)

13.1.2 Method. DPA examination shall be performed in accordance with method 2101 of MIL-STD-750 and as modified below.

13.1.2.1 Exceptions/clarifications to method 2101, MIL-STD-750 and as specified herein.

* a. Electrical test - Not required.

* b. Axial lead tensile test - Not required.

c. Resistance to solvents test - Not required.

d. Solderability test - Not required.

e. One half (round up) of the DPA samples shall be subjected to scribe and break testing and the other half shall be subjected to cross-sectioning.

13.2 Diodes, RF/microwave (gunn, pin, varactor, beam lead/quad arrays).

13.2.1 Method. RF/microwave diodes shall be tested in accordance with 21.1 herein. Some tests such as bond pull and die shear may not be practical due to the device size or construction. SEM will be used on all samples to adequately document die and bond attach integrity when these tests can not be performed, in addition to documenting anomalous conditions or verifying metallization coverage. Internal visual inspection shall be performed in accordance with method 2074 of MIL-STD-750, for these devices as applicable to the design.

13.2.1.1 Special instructions. Bond wires that are terminated within the lid-to-package interface, shall be examined at a minimum magnification of 400X in an SEM after delid for the presence of damage and neckdown due to the lid seal operation. Inspection criteria shall be in accordance with method 2074 of MIL-STD-750.

13.3 Metal Can Stud mounted and axial lead metal can instructions

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13.3.1 Method. The DPA examination shall be performed in accordance with Method 2101 of MIL-STD-750.

13.3.1.1 External visual examination. Perform an external visual examination at magnification of 15X or greater to adequately resolve the area being examined. Note any change from baseline drawings or any discrepancies. Take one representative photomacrograph of a sample device prior to sectioning and record any evidence of:

a. Damage, corrosion, or contamination.

b. Defects in seal or dents in package.

c. Defects in plating such as flaking, peeling, or blistering.

13.3.1.2 Hermetic seal. The devices shall be tested according to method 1071 of MIL-STD-750. Fine leak testing shall be according to condition G or H. Gross leak testing shall be according to condition C, D, or E. No bubbles or fluorescent residue should be present.

13.3.1.3 Radiographic examination. Radiograph all samples in two views 90 degrees apart (x and y directions) in accordance with method 2076 of MIL-STD-750 and note any anomalies.

13.3.1.4 PIND. Perform PIND testing on all samples in accordance with method 2052 of MIL-STD-750, condition A.

13.3.1.5 Internal water vapor testing/ RGA. Perform internal water vapor/RGA testing in accordance with method 1018 of MIL-STD-750. The sample size for this testing will be one for QPL/QML devices and three for non-QPL devices with zero failures or five devices with a maximum of one failure (3/0, 5/1). It is preferred that additional devices over and above the DPA samples be provided for this testing so that it may be processed in parallel to the DPA. If this cannot be done due to cost or availability issues, care should be taken to ensure that a minimal amount of damage results to the internal structures of the device during this test. Any damage caused by the intrusion of the puncturing tool into the cavity(s) of the device(s) shall be noted.

13.3.1.6 Suggested package delidding. Prior to opening, the height of the header should be determined from the manufacturer's photo expositional drawings or from previous radiographic examination. The lid should be carefully cut with a special can opener device designed specifically for that purpose (any equivalent available device may be used). The cut in the lid should be at a point sufficiently above the header so that the cover can be easily removed by hand. During cutting and removal of the lid, care must be exercised to avoid damage of internal elements or introduction of external contaminants into the internal enclosure area.

13.3.1.7 Crimp tubulation inspection (applicable to crimped lead devices only). A minimum 50 percent of the samples (round down) with leads that are crimped to the internal posts of the device shall be opened in a manner such that a crimp pull test can be performed between the post and the crimped area of the tubulation. The minimum pull test strength allowable shall be one pound and the data shall be recorded. A sample of the worst case crimp (visually observed) shall be mounted and cross-sectioned in a plane transverse to the longitudinal axis of the tubulation through the most mechanically compressed portion of the crimp. Metal to metal contact must be a minimum of 75 percent of the post wire circumference.

13.3.1.8 Internal visual (decap visual). Each sample device shall be subjected to decap visual examination, which is in accordance with method 2074 of MIL-STD-750.

a. Determination of "as delivered" device condition: This examination is a verification that the device sealing process and 100-percent screening have not contaminated or otherwise adversely affected the devices.

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