The documentation and process conversion measures necessary to comply with this revision shall be completed by 30 September 2010.

INCH - POUND

MIL-STD-883H
26 February 2010
SUPERSEDING
MIL-STD-883G
28 February 2006

DEPARTMENT OF DEFENSE

TEST METHOD STANDARD

MICROCIRCUITS

AMSC N/A

FSC 5962

FOREWORD

1. This standard is approved for use by all Departments and Agencies of the Department of Defense.

2. Comment, suggestions, or questions on this document should be addressed to: Commander, Defense Supply Center * Columbus ATTN: DSCC-VA, P.O. Box 3990, Columbus, OH 43218-3990, or by email to STD883@dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online * database at: https://assist.daps.dla.mil.

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FIGURE

TEST METHODS

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1. SCOPE

1.1 Purpose. This standard establishes uniform methods, controls, and procedures for testing microelectronic devices suitable for use within Military and Aerospace electronic systems including basic environmental tests to determine resistance to deleterious effects of natural elements and conditions surrounding military and space operations; mechanical and electrical tests; workmanship and training procedures; and such other controls and constraints as have been deemed necessary to ensure a uniform level of quality and reliability suitable to the intended applications of those devices. For the purpose of this standard, the term "devices" includes such items as monolithic, multichip, film and hybrid microcircuits, microcircuit arrays, and the elements from which the circuits and arrays are formed. This standard is intended to apply only to microelectronic devices. The test methods, controls, and procedures described herein have been prepared to serve several purposes:

a. To specify suitable conditions obtainable in the laboratory and at the device level which give test results equivalent to the actual service conditions existing in the field, and to obtain reproducibility of the results of tests. The tests described herein are not to be interpreted as an exact and conclusive representation of actual service operation in any one geographic or outer space location, since it is known that the only true test for operation in a specific application and location is an actual service test under the same conditions.

b. To describe in one standard all of the test methods of a similar character which now appear in the various joint-services and NASA microelectronic device specifications, so that these methods may be kept uniform and thus result in conservation of equipment, manhours, and testing facilities. In achieving this objective, it is necessary to make each of the general tests adaptable to a broad range of devices.

c. To provide for a level of uniformity of physical, electrical and environmental testing; manufacturing controls and workmanship; and materials to ensure consistent quality and reliability among all devices screened in accordance with this standard.

1.2 Intended use of or reference to MIL-STD-883. When this document is referenced or used in conjunction with the processing and testing of JAN devices in conformance with the requirements of appendix A of MIL-PRF-38535, QML devices in conformance with MIL-PRF-38535 or non-JAN devices in accordance with 1.2.1 or 1.2.2 herein, such processing and testing is required to be in full conformance with all the applicable general requirements and those of the specifically referenced test methods and procedures.

For contracts negotiated prior to 31 December 1984, device types that have been classified as manufacturer's 883 (B or S) product prior to 31 December 1984 are not required to meet 1.2.1 or 1.2.2.

Existing contracts as of the 31 December 1984, previously negotiated add-ons to these contracts, and future spares for these contracts may continue to use device types which were classified as manufacturer's 883 (B or S) prior to 31 December 1984.

New contracts, and any device types classified as compliant to MIL-STD-883 after 31 December 1984 are required to comply with 1.2.1. Any devices meeting only the provisions of 1.2.2 are noncompliant to MIL-STD-883.

1.2.1 Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices. When any manufacturer, contractor, subcontractor, or original equipment manufacturer requires or claims a non-JAN part compliant with MIL-STD-883, all provisions of Appendix A of MIL-PRF-38535 are required to be met. In addition, manufacturers that have produced or are producing products in accordance with 1.2.1a are subject to a Government compliance validation audit on a drop-in basis with a minimum of notice. Such processing and testing are required to be in compliance with all of the applicable general controls and requirements defined herein and those of the specifically referenced test methods and procedures with no reinterpretations, deviations or omissions except as specifically allowed in the device specification or standard microcircuit drawing covering the same generic device. Deviations specifically granted in the device specification or standard microcircuit drawing may also be applied to devices manufactured in the same process, to the same design criteria, and using elements of the same microcircuit group as those used for devices covered by the device specification or standard microcircuit drawing. Such reference include the following:

Manufacturers who use MIL-STD-883 in device marking, or make statements in applicable certificates of conformance that parts are compliant with MIL-STD-883, or make statements in advertisements or in published brochures or other marketing documents that parts provided are compliant with MIL-STD-883.

Contractors, sub-contractors, or original equipment manufacturers who prepare vendor item drawings, (previously called Specification Control drawings), or Selected Item drawings which require compliance with MIL-STD-883, or invoke it in its entirety as the applicable standard (see 1.2.2 for noncompliant devices).

a. Custom monolithic, non-JAN multichip and all other non-JAN microcircuits except non-JAN hybrids described or implied to be compliant with methods 5004 and 5005 or 5010 of MIL-STD-883 are required to meet all of the non-JAN requirements of Appendix A of MIL-PRF-38535.

b. Hybrid microcircuits described as compliant or multichip microcircuits described as compliant to MIL-PRF-38534 are required to meet all the requirements of MIL-PRF-38534 (or equivalent procedures/ requirements of reciprocal listing provisions for product of other nations based on existing international agreements):

1.2.2 Provisions for the use of MIL-STD-883 in conjunction with non-compliant non -JAN devices. Any device that is processed with deviations and which is not processed in compliance with the provisions of 1.2.1 defined herein cannot be claimed to be compliant and cannot be marked "/883", "/883B", "/883S", or any variant thereof. All applicable documentation (including device specifications or manufacturer's data sheets and responses to RFQ's invoking MIL-STD-883) are required to clearly and specifically define any and all areas of nonconformance and identify them as deviations in language that is not subject to misinterpretation by the acquiring authority.

If the contract or order specifically requires compliance with, equivalence to, or a product that is equal to or better than MIL-STD-883 class B or class S, any exceptions taken to the requirements of the referenced quality level (i.e., 1.2.1 above) prohibit the manufacturer from claiming or implying equivalence to that level.

Specific reference to one or more MIL-STD-883 method(s) on a stand-alone basis requires compliance to only the specifically referenced method(s). Such devices are not considered compliant in accordance with 1.2.1 above. However, compliance with only the test procedures contained in test methods 5004, 5005, and 5010 on a stand-alone basis (without specifying compliance or noncompliance to 1.2.1) does not satisfy the requirement for form, fit, and function defined in MIL-PRF-38535 for configuration items, and any reference to these methods on a stand alone basis requires compliance to all the provisions of 1.2.1.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, and 5 of this standard. This section does not include documents cited in other sections of this standard or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3, 4, and 5 of this standard, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-PRF-19500	-	Semiconductor Devices, General Specification For.
MIL-PRF-38534	-	Hybrid Microcircuits, General Specification For.
MIL-PRF-38535	-	Integrated Circuits (Microcircuits) Manufacturing, General Specification For.

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-1835	-	Electronic Component Case Outlines.

DEPARTMENT OF DEFENSE HANDBOOKS

MIL-HDBK-217	-	Reliability Prediction of Electronic Equipment.
MIL-HDBK-505	-	Definitions of Item Levels, Item Exchangeability, Models, and Related Terms.

* (Copies of these documents are available online at https://assist.daps.dla.mil/quicksearch/ or from the Standardization Documents Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO) STANDARDS

ISO 14644-1	-	Cleanrooms and Associated Controlled Environments – Part 1: Classification of Air Cleanliness.
ISO 14644-2	-	Cleanrooms and Associated Controlled Environments – Part 2: Specifications for Testing and Monitoring to Prove Confined Compliance with ISO 14644-1.

* (Copies of these documents are available online at http://www.iso.org or from International Organization for Standardization (ISO), 1, ch. de la Voie-Creuse Case Postale 56, CH-1211 Geneva 20, Switzerland.)

IPC-ASSOCIATION CONNECTING ELECTRONICS INDUSTRIES (IPC)

IPC-T-50	-	Terms and Definitions for Interconnecting and Packaging Electronic Circuits.

(Copies of these documents are available online at http://www.ipc.org or from the IPC-Association Connecting Electronic Industries, 3000 Lakeside Drive, Suite 309 S, Bannockburn, IL 60015-1249.)

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

* ANSI/NCSL Z540.3	-	Requirements for the Calibration of Measuring and Test Equipment, General Requirements
ANSI/J-STD-004	-	Requirements for Soldering Fluxes
ANSI/J-STD-005		Requirements for Soldering Pastes
ANSI/J-STD-006	-	Requirements for Electronic Grade Solder Alloys and Fluxed and Non-fluxed Solid Solders for Electronic Soldering Applications

(Copies of these documents are available online at http://ansi.org or from to the American National Standards International, 25 West 43RD Street, 4TH Floor, New York, NY 10036)

ELECTRONICS INDUSTRIES ALLIANCE

IPC/EIA/JEDEC J-STD-002	Solderability Tests for Component Leads, Terminations, Lugs, Terminals and Wires.
* EIA/JESD22-B116	Wire Bond Shear Test
EIA/JESD78	IC Latch-up Test.
* EIA-557	Statistical Process Control Systems.

(Copies of these documents are available online at http://www.eia.org or from the Electronic Industries Alliance, 2500 Wilson Boulevard, Arlington, VA 22201-3834; or from IPC, 2215 Sanders Road, Northbrook, IL 60062-6135.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM E 263	-	Standard Test Method for Measuring Fast-Neutron Reaction Rates by Radioactivation of Iron.
ASTM E 264	-	Standard Test Method for Measuring Fast-Neutron Reaction Rates by Radioactivation of Nickel.
ASTM E 265	-	Standard Test Method for Measuring Reaction Rates and Fast-Neutron Fluences by Radioactivation of Sulfur-32.
* ASTM E 666	-	Standard Practice for Calculating Absorbed Dose from Gamma or X-Radiation.
ASTM E 668	-	Standard Practice for Application of Thermoluminescence-Dosimetry (TLD) Systems for Determining Absorbed Dose on Radiation Hardness Testing of Electronic Devices.
ASTM E 720	-	Standard Guide for Selection and Use of Neutron Sensors for Determining Neutron Spectra Employed in Radiation-Hardness Testing of Electronics.
ASTM E 721		Standard Method for Determining Neutron Energy Spectra with Neutron-Activation Foils for Radiation-Hardness Testing of Electronics.