NOT MEASUREMENT
SENSITIVE

MIL-HDBK-780C
15 AUGUST 1997
SUPERSEDING
MIL-HDBK-780B
1 MARCH 1994

DEPARTMENT OF DEFENSE
HANDBOOK

STANDARD MICROCIRCUIT DRAWINGS

AMSC N/A

FSC 5962

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

FOREWORD

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

2. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Defense Supply Center Columbus ATTN: DSCC-VA, P O Box 3990, Columbus, OH 43216-5000 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

3. This handbook provides guidance on standard microcircuit drawings (SMD's). The purpose of the SMD program is to minimize the proliferation of specification and source control drawings within the Department of Defense (DoD). The use of one SMD for an item of supply in use by DoD Departments and Agencies is the objective of this program.

4. It is intended that the issue of SMD's affect DoD procurement through minimizing the proliferation of duplicate drawings for an item of supply.

5. It is also the objective of the SMD Program that the resulting drawing be multiuser in actual implementation.

6. The application of this handbook is currently confined to the acquisition of microcircuits until such time that applicability to federal supply classes other than FSC 5962 is deemed appropriate.

CONTENTS

CONTENTS

CONTENTS

CONTENTS

FIGURES

1. SCOPE

1.1 Scope. This handbook provides guidance and information concerning *standard microcircuit drawings* (SMD's). System applications are subject to the approval of the applicable program office.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, and 5 of this handbook. This section does not include documents cited in other sections of this handbook or recommended or 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 handbook, 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 listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

DEPARTMENT OF DEFENSE

MIL-PRF-38534 - Hybrid Microcircuits, General Specification for.
MIL-PRF-38535 - Integrated Circuits (Microcircuits) Manufacturing, General Specification for.

STANDARDS

DEPARTMENT OF DEFENSE

MIL-STD-100 - Engineering Drawing Practices
MIL-STD-883 - Test Method Standard Microcircuits
MIL-STD-973 - Configuration Management

HANDBOOKS

DEPARTMENT OF DEFENSE

MIL-HDBK-103 - List of Standard Microcircuit Drawings (SMD's)

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Standardization Document 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 the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME Y14.5M-1994 - Dimensioning and Tolerancing

(Application for copies should be addressed to the American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017-2392.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other information services.)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. DEFINITIONS

3.1 Standard microcircuit drawing (SMD). SMD depict the Government's requirements for an existing commercial item, tested for a military application, disclosing applicable configuration, envelope dimensions, mounting and mating dimensions, *interface dimensional characteristics*, specified performance requirements, and inspection and acceptance test requirements as appropriate for a military environment.

3.2 *General specification.* A general specification is prepared in the six-section format and covers requirements and test procedures that are common to a group of parts, materials, or equipments. It is used with either associated device specifications, specification sheets or SMD's (not a mixture); e.g., MIL-PRF-38534 or MIL-PRF-38535 for microcircuits.

3.3 Military Parts Control Advisory Group (MPCAG). A DoD organization which provides advice to the military departments and military contractors on the selection of parts in assigned commodity classes, and collects data on nonstandard parts for developing and updating military specifications and standards.

4. GENERAL REQUIREMENTS

4.1 Introduction. This section provides general guidelines regarding contents, organization, and paragraphing applicable to the preparation of SMD's. SMD's are drawings prepared in accordance with MIL-STD-100 and the guidance contained herein.

4.2 Sectional arrangement of an SMD. An SMD contains six sections, titled and numbered as shown below. SMD's should be in standard drawing format in accordance with MIL-STD-100 (see figures 1 and 2).

1. SCOPE
2. APPLICABLE DOCUMENTS
3. REQUIREMENTS
4. QUALITY ASSURANCE PROVISIONS
5. PACKAGING
6. NOTES

4.2.1 Subject matter. Subject matter should be kept within the scope of the sections so that the same requirements or information will always appear in the same section of every SMD. If there is no information pertinent to a section, the following should appear below the section heading:

"*This section is not applicable to this drawing*".

4.2.2 Section 1.

4.2.2.1 Scope. The scope should repeat the item name and its modifiers, and provide a clear, concise abstract of the coverage of the SMD. This brief statement is the beginning paragraph. The scope should not contain requirements that should be part of section 3. Figures are not included in the scope.

4.2.2.2 Part or Identifying Number (PIN). Section 1 includes a paragraph entitled "PIN" which describes how the SMD PIN is constructed (see 5.3.5.1.2).

4.2.3 Section 2.

4.2.3.1 Listing of references. Section 2 is used to list those documents referenced in the SMD. Government specifications, standards, adopted non-Government standards, international standardization documents, handbooks, drawings, and approved publications may be referenced in microcircuit drawings. Other non-Government documents promulgated by non-Government standards bodies may also be referenced. Government regulations or codes are referenced as applicable. Military Activity Regulations and other documents not readily available from or through the contracting activity are not referenced in an SMD. Care should be taken in referencing non-Government publications to assure the availability of copies and to acquire prior approval of copyright owner. All those documents identified and referred to in sections 3, 4, and 5 of the SMD are listed in section 2. References are confined to documents currently available at the time of issuance of the SMD. Figures bound integrally with the SMD are not listed in section 2 unless they are reduced-size copies of drawings provided for information only.

4.2.3.1.1 Government documents. Referenced Government documents are listed by document title and identifier excluding revision letters (unless otherwise specified) or suffix (preparing activity symbols) and the "00" designation for "USED IN LIEU OF". The titles should be taken from the documents rather than an index. Government specifications, standards, handbooks, drawing and publications as applicable are listed numerically (except Federal specifications which are listed alpha-numerically) under these headings and in individual groups such as Federal, Military, and Departmental activity (such as Naval Air Systems Command, etc.). These listings should be included under the following paragraph:

"2.1 Government documents.

2.1.1 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 listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, *cited in the solicitation.*

The following types of publications should all be listed (as applicable) in the order shown after 2.1.1:

Federal Specifications
Military Specifications
Federal Standards
Federal Information Processing Standards
Military Standards
Military Handbooks

"2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this drawing to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation."

The following types of publications should be listed (as applicable) in the order shown after 2.1.2:

Other Government Documents (e.g., Department of Transportation Specifications, U.S. Department of Agriculture Specifications, etc.)

Drawings
Publications

List only those documents that are applicable. Where detailed drawings referred to in an SMD are listed in an assembly drawing, it is only necessary to list the assembly drawing. The following parenthetical source paragraph is included at the end of 2.1.2:

"(Copies of specifications, standards, handbooks, drawings, publications, and other government documents required by contractors in connection with specified acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)"

4.2.3.1.2 Non-Government standards and other publications. Non-Government standards and other publications including DoD adopted documents not normally furnished by the Government should be listed in appropriate order (numerically or alpha-numeric) under the headings of the respective non-Government standard bodies. Titles should be taken from the document rather than from an index. This listing is included under the following subparagraph.

> "2.2 Non-Government publications. The following documents form a part of this SMD to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted shall be those listed in the issues of the DoDISS specified in the solicitation. Unless otherwise specified, the issues of the documents not listed in the DoDISS shall be the issue of the non-Government documents which is current on the date of the solicitation."

In addition, the following parenthetical source statement follows each individual publication which may be obtained from a common source:

> "(Application for copies should be addressed to the (name and address of the source.)"

The following source paragraph is placed at the bottom of the list when applicable.

> "(Non-Government standards and other publications are normally available from the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services.)"

4.2.3.1.3 Order of precedence. In order to avoid confusion in the possible conflict between the requirements of the drawing and the documents referenced therein, the following statement should be included:

> "2.3 Order of precedence. In the event of a conflict between the text of this drawing and the reference cited herein the text of this drawing shall take precedence."

4.2.4 Section 3.

4.2.4.1 Requirements. Section 3 of the SMD states the necessary requirements (materials, physical and performance characteristics, processes, reliability, human factors, marking, workmanship, etc.) for obtaining the product which the SMD is prepared. The requirements should represent the actual essential needs of the Government to satisfy the intended use and application. Care should be exercised to ensure that the stated essential needs result in acquisition of acceptable quality products at the least life cycle cost to the Government. Requirements should be described in a manner to encourage competition and to avoid restrictive features which would limit acceptance to one or a relatively few contractors. Requirements should be so worded as to provide a definite basis for rejection when testing and examination of product reveals the product is unsuitable for the purpose intended. Care should be exercised to avoid unrealistic or ambiguous requirements and those which conflict with supplier capabilities and referenced documents.

4.2.4.1.1 Organization of requirements. Care should be taken to provide for a systematic arrangement of requirements to facilitate design, manufacturing, and inspections.

4.2.4.1.2 Sequencing of requirements and tests. When possible, the test paragraphs in section 4 should be placed in the same sequence as the requirement paragraph in section 3. An example of sequencing requirements and tests is as follows:

Requirement	Test
3.6 Shock	4.7.1 Shock
3.7 Vibration	4.7.2 Vibration
3.8 Noise	4.7.3 Noise
3.9 Electromagnetic interference	4.7.4 Electromagnetic interference

4.2.4.2 Materials. Requirements for materials to be used in the item(s) covered by the SMD are stated under this heading, except where it is more practical to include the information in other paragraphs. Requirements of general nature should be followed by specific requirements for the material. Definitive documents should be referenced for the material when such documents cover materials of the minimum required quality.

4.2.4.3 Design. The major functional characteristics should be specified. The intended use is covered in Section 6 of the SMD. Detailed design should be covered in individual paragraphs.

4.2.4.4 Construction. The specified points of construction should be included, as applicable. Construction requirements should be related to the physical limitations imposed and the stresses that equipment is expected to withstand.

4.2.4.5 Hardware. Standard military hardware should be designed into assemblies to the maximum extent possible. This includes mounting hardware when required to be furnished with the product. Selection of the hardware should be made from existing standards (such as MS, NAS, and AN standards), if possible, or from other standards required by contract.

4.2.4.6 Performance characteristics. General and detail performance characteristics should be included under this or other appropriate headings specifying what is expected of the commodity. Each requirement in Section 3 should have a corresponding test method in section 4. The requirement paragraph should reference the applicable test paragraph; "(see 4._)".

4.2.4.7 Dimensions. Dimensions and tolerances will be in accordance with ASME Y14.5M-1994.

4.2.4.8 Finish. Finish should include such properties as surface roughness, freedom from burrs, corrosion, metallic and nonmetallic coatings.

4.2.4.9 Marking. Requirements for marking should reference MIL-PRF-38534 or MIL-PRF-38535. When section 3 specifies that certain item marking is to be placed on the unit container, section 5 should specify the container marking described. When part numbering is a requirement, the section 3 paragraph should reference section 1 paragraph or the appropriate appendix for a description of the part numbering scheme.

4.2.4.10 Selection of alternative materials, construction, etc. When alternate acceptable materials, construction, appearance, or other characteristics are stated in SMD's without specific provisions as to selectivity to be exercised in acquisition, the alternatives are to be considered interchangeable. In such cases, it should be clearly stated in the SMD that the selection of a specific alternative is at the option of the contractor.

4.2.4.11 Certificate of compliance. A certificate of compliance (see figure 3) is required from a manufacturer in order to be listed as a source of supply in MIL-HDBK-103 (see 4.2.7.4). The certificate of compliance submitted prior to listing as a source of supply should affirm that the manufacturer's product meets the requirements of the applicable specification (see 6.3).

4.2.4.12 Certificate of conformance. The certificate of conformance should be in accordance with the applicable general specification and should be provided with each lot of items delivered to the SMD.

4.2.4.13 Notification of change or discontinuance. Notification of change or discontinuance is required in accordance with MIL-STD-973.

4.2.4.14 Verification and review. The Government retains the option to review the device manufacturer's facility and applicable required documentation.

4.2.5 Section 4.

4.2.5.1 Quality assurance provisions. Section 4 should include all inspections (by reference when applicable) to be performed in order to determine that the item conforms to requirements of sections 3 and 5 of the SMD.

4.2.5.2 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for all inspection requirements specified. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the SMD where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2.5.3 Responsibility for compliance. All items must meet all requirements of sections 3 and 5 of the SMD. The inspection set forth in the SMD should become part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the SMD does not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.2.5.4 Quality conformance inspection. The tests listed in section 4 of the SMD to determine conformance with sections 3 and 5 requirements, should include, when necessary, a measurement or comparison with specified characteristics and checks and tests of the performance and reliability requirements. Each item must meet all sections 3 and 5 requirements. The test methods in section 4 of the SMD are minimum inspection and test methods to be used to document compliance to the SMD requirement.

4.2.5.4.1 Quality conformance inspection sampling. When it is desirable to specify the sampling procedure to be used by contractors for the performance of quality conformance inspection, the sampling procedure should:

a. Impose no inspection procedures that are less efficient and effective than would normally be used by the industry.

b. Clearly identify the sampling plan to be used in the manufacturing process when inspections are to be performed at intermediate points, as well as, on the end item.

c. Be capable of assuring compliance with requirements under various conditions of manufacturing or purchasing, e.g., mass or job lot production and large or small lot purchasing.

When inspections are to be based on lots of material, a definition of a lot size(s) should be furnished in this section by reference, if applicable. Restrictions concerning the formation of inspection lots such as restricting inspection lots of units of the same type, class, size, should be specified. Restriction of units forming the lot of those produced from the same assembly line, etc., should also be specified, when applicable.

4.2.5.5 Classification of quality conformance inspections. Quality conformance inspections should be classified into group A, B, C, D or E in accordance with the following groupings, when applicable:

Group A - Nondestructive inspections of all items produced or all samples from an inspection lot demonstrate product compliance with contractual requirements. Group A inspection examines characteristics most affected by variations in production processes or skills, and functions vital to successful completion of the design mission.

Group B - Generally nondestructive inspections that are more complex or of a longer duration than group A inspection. Group B inspection examines characteristics more affected by part or equipment quality and less affected by variations in production processes or skills, and functions requiring special fixtures or environments. Fewer samples are inspected than for group A inspections and test articles may be offered for acceptance with little or no refurbishment. Each commodity should be individually evaluated regarding its issue after performing group B and C inspections.

Group C - Periodic and generally destructive tests of characteristics depending upon product design and materials. Group C inspection consists of more complex tests, usually including emulated service environments, is generally destructive and may require major refurbishment before tested articles can be used by the services. Tests are based on production quantities or time period.

Group D - Destructive test or test of long duration that consumes all or a considerable portion of design service life. Articles subjected to group D inspection should not be issued. Tests are performed on few samples based on production quantities or time period.

4.2.5.6 Tabular listing of quality conformance inspection. Where it will lead to better understanding of their functions, the inspections should be listed as group A, B, C, D or E in tabular form with appropriate references to applicable requirements, and inspection methods in MIL-STD-883, MIL-PRF-38534, or MIL-PRF-38535 as illustrated below:

> " 4.3 Quality conformance inspection. Quality conformance inspection shall be in accordance with method 5005 of MIL-STD-883 including groups A, B, C, and D inspections. The following additional criteria shall apply.

MIL-STD-883 test requirements	Subgroups (in accordance with MIL-STD-883, method 5005, table I)
Interim electrical parameters (method 5004)	
Final electrical test parameters (method 5004)	
Group A test requirements (method 5005)	
Groups C and D end-point electrical parameters (method 5005)	

4.2.6 Section 5.

4.2.6.1 Packaging, packing, and marking. Packaging, packing, and marking should be as specified in the applicable general specification.

4.2.7 Section 6.

4.2.7.1 Notes. Section 6 should contain information of a general or explanatory nature and no requirements should appear therein. It should contain information designed to assist in determining the applicability of the SMD.

4.2.7.2 Intended use. Items conforming to the SMD are intended for use for Government microcircuit applications (original equipment), design applications, and logistics purposes.

4.2.7.3 Comments. Comments on the SMD should be directed to the applicable MPCAG.

4.2.7.4 Sources of supply. Sources of supply will be identified in MIL-HDBK-103 (see 4.3) or the appropriate Qualified Manufacturers List (QML). The vendors so listed will have agreed to the SMD and submitted a certificate of compliance (see 4.2.4.11) and completed qualification requirements. Additional sources will be added to these listings as they become available.

4.3 Approved SMD's. SMD's in use by DoD and industry are listed in MIL-HDBK-103.

4.3.1 SMD user. When a contractor or DoD component has a system application for an existing SMD, as listed in MIL-HDBK-103, it is essential that the applicable MPCAG be informed accordingly.

4.3.2 Changes to SMD's. Utilizing user identification in accordance with MIL-HDBK-103, proposed changes or draft revisions are coordinated with all users of record. Changes are implemented in accordance with the provisions of MIL-STD-973. SMD's are maintained by the MPCAG. Approved revisions to SMD's are distributed by the MPCAG to all known users of record.

4.3.3 Nonconcurrence with proposed changes. User nonconcurrence with a proposed change to an SMD requires MPCAG resolution of the stated nonconcurrence. Unresolved nonconcurrence will require MPCAG action as appropriate, i.e., nonconcurrence-reply, with technical justification, to the originator of the change proposal, new SMD's that address the diverse needs of the users involved, or advisory to user of need to generate new part acquisition documentation.

5. DETAILED REQUIREMENTS

5.1 Introduction. *This section contains guidance for SMD's.*

5.2 Drawing preparation. In coordination with and with the approval of the applicable Program Office, a MPCAG (see 3.3) will respond to a parts approval request with a drawing preparation package consisting of the following:

a. Drawing number

b. All known sources of supply

5.3 Initial drawing preparation.

5.3.1 Blank drawings. Blank drawings are not provided. Drawing format should be in conformance to figures 1 and 2.

5.3.2 SMD coordination. Preliminary draft coordinations with MPCAG and device manufacturers, comment resolution, certificate of compliance transmittal and final SMD preparation should be in conformance with figure 4.

5.3.3 Preliminary and final draft submittal. Preliminary draft will be typed and spaced in accordance with the drawing format (figures 1 and 2). Handwritten or pasted catalog excerpts are not acceptable. This preliminary draft may be on standard 8 1/2" x 11" paper. Once started by the contractor, it is expected that the process described herein will be completed. Preliminary drafts should be clearly marked preliminary draft on the first and last pages.

5.3.3.1 Preliminary draft construction. The preliminary draft is constructed through communication with the applicable MPCAG (see 6.2).

5.3.4 Maintenance. Maintenance of approved SMD's is the responsibility of the applicable MPCAG.

5.3.5 SMD content preparation. The following detail should be reviewed in conjunction with figure 5, especially regarding "boilerplate" location and content. The following detail reflects the current exclusive applicability of SMD's to Microcircuits.

5.3.5.1 Section 1, scope. 1. SCOPE should be as shown on figure 5 and conform to 4.2.2.1 as specified herein.

5.3.5.1.1 Scope. 1.1 Scope. should be as shown on figure 5.

5.3.5.1.2 PIN. The PIN should be structured in accordance with figure 5. The device type should be a two digit number, assigned sequentially, starting with 01, 02, 03, etc., depending upon how many parts are being included in the drawing.

5.3.5.1.2.1 PIN length. The length of the PIN should comply with MIL-STD-100 and not exceed 15 characters.

5.3.5.1.3 *Radiation hardness assurance (RHA) designator*. Radiation hardness assurance should be as shown on figure 5 in 1.2.1.

5.3.5.1.4 Device type(s). Device type(s) should be as shown on figure 5 in 1.2.2.

5.3.5.1.5 Device class designator. The device class designator should be as shown on figure 5 in 1.2.3.

5.3.5.1.6 Case outline. The case outline(s) should be as shown on figure 5 in 1.2.4.

5.3.5.1.7 Lead finish. Lead finish should be as shown on figure 5 in 1.2.5.

5.3.5.1.8 Absolute maximum ratings.

a. The absolute maximum rating will be typed in two columns with dashes connecting as shown in the sample SMD, on figure 6.

b. The absolute maximum ratings will be as defined in the valid characterization data supplied by the manufacturer for the specific part and must include the thermal resistance, as specified in MIL-STD-1835 for the applicable case outline.

c. Foot notes referenced in this paragraph will be located a minimum of two line spaces below the last parameter.

5.3.5.1.9 Recommended operating conditions.

a. The recommended operating conditions will be typed in two columns with dashes connecting, as shown in the sample SMD, on figure 6.

b. The recommended operating conditions will be as defined in the valid characterization data supplied by the manufacturer for the specific part.

c. Foot notes referenced in paragraph 1.4 will be located a minimum of two line spaces below the last parameter.

5.3.5.2 SECTION 2, applicable documents. Section 2 should appear as shown on figure 5 and follow the guidelines of 4.2.3 as contained herein.

5.3.5.2.1 Order of precedence. Order of precedence should be as shown on figure 5 in 2.2 and 4.2.3.1.3 as specified herein.

5.3.5.3 Section 3, requirements. Section 3 should appear as shown on figure 5 and the guidelines furnished in 4.2.4. Specific requirement paragraphs should be included in an SMD or on an as required basis.

5.3.5.3.1 Item requirements. Item requirements should be as shown on figure 5 in 3.1.

5.3.5.3.2 Design, construction and physical dimensions. Design, construction and physical dimensions should be as shown on figure 5 in 3.2.

5.3.5.3.3 Terminal connections. Terminal connections should be as shown on figure 5 in 3.2.2.

5.3.5.3.4 Block diagram. Although figure 5, 3.2.4 specifies block diagram, this paragraph will be used to designate block, functional, or logic diagram, as appropriate, for the device being documented.

5.3.5.3.5 Truth tables. Truth tables should appear as on figure 5 in 3.2.3.

5.3.5.3.6 Case outline(s). Case outline(s) should appear as on figure 5 in 3.2.1.

5.3.5.3.7 Electrical performance characteristics and postirradiation parameter limits. Electrical performance characteristics should be as shown on figure 5 in 3.3. Valid characterization data supplied by the manufacture will determine the use of ambient or case operation temperature range.

5.3.5.3.8 Electrical test requirements. Electrical test requirements should be as shown on figure 5 in 3.4.

5.3.5.3.9 Marking. Marking should be as shown on figure 5 in 3.5.

5.3.5.3.10 Tables. Tables e.g., table I, electrical performance characteristics, should be as shown on figure 5. If necessary, a device type column may be added between the Conditions and group A subgroups column to accommodate differences in test conditions and limits, when more than one device type is being specified.

Required temperature parameters for each specific part will be typed under the heading Conditions, as shown on figure 5.

5.3.5.3.11 Graphics.

a. Views that are referenced as shown on figure 5 in 3.2, will be located after table 1.

b. All data necessary for terminal connections will be identified in a table format or be drawn as defined in MIL-STD-1835. Refer to sample SMD, figure 6.

c. Whenever two different case outlines are required, an additional page will be added to accommodate the required data with figure 1 continued.

d. All data necessary for additional views will be drawn as defined in MIL-PRF-38535. Refer to sample SMD, figure 6. Use valid characterization data supplied by the manufacturer for the specific device type.

e. Switching times test circuit and waveforms that are required will be drawn similar in format to that shown on the sample SMD, figure 6. Use valid characterization data supplied by the manufacturer for the specific device type.

5.3.5.3.12 Certificate of compliance. The certificate of compliance execution should be as shown on figure 5 in 3.6.

5.3.5.3.13 Certificate of conformance. The certificate of conformance should be as shown on figure 5 in 3.7.

5.3.5.3.14 Notification of change. Notification of change should be as shown on figure 5 in 3.8.

5.3.5.3.15 Verification of change. Verification of change should be as shown on figure 5 in 3.9.

5.3.6 Section 4, quality assurance provisions. Section 4 should appear as shown on figure 5 and 4.2.5 as contained herein.

5.3.6.1 Sampling and inspection. Sampling and inspection should be as shown on figure 5 in 4.1.

5.3.6.2 Screening. Screening should be as shown on figure 5 in 4.2. Valid characterization data supplied by the manufacturer will be used for figure 5, 4.2.1a and 4.2.1b.

5.3.6.3 Qualification inspection. Qualification inspection should be as shown on figure 5 in 4.3.

5.3.6.4 Conformance inspection. Quality conformance inspection should be as shown on figure 5 in 4.4 and the guidance contained in 4.2.5.4 herein.

5.3.6.4.1 Group A inspection. Additional group A inspection requirements should be as shown on figure 5 in 4.4.1. Valid characterization data supplied by the manufacturer will be used for 4.4.1 subparagraphs (see figure 5).

5.3.6.4.2 Group C inspection. Additional group C inspection requirements should be as shown on figure 5 in 4.4.2. Valid characterization data supplied by the manufacturer will be used for 4.4.2 subparagraphs (see figure 5).

5.3.6.4.3 Group D inspection. Additional group D inspection requirements should be as shown on figure 5 in 4.4.3.

5.3.6.4.4 Group E inspection. Additional group E inspection requirements should be as shown on figure 5 in 4.4.4. Valid characterization data supplied by the manufacturer will be used for 4.4.4 subparagraphs.

5.3.6.5 Tables, electrical tests.

a. The table of electrical test requirements will be formatted as shown on figure 5, table II.

b. The identification of subgroups and tests will be defined in the applicable general specification and valid characterization data supplied by the manufacturer.

c. Any footnote referenced in the table will be located a minimum of two line spaces below the bottom line of the table.

d. Notes using the term guaranteed will not be included as a part of the preliminary draft, before submittal to the sources of supply.

5.3.7 Section 5, packaging. Section 5 should appear as shown on figure 5 and the guidance indicated in 4.2.6.1 as specified herein.

5.3.7.1 Packaging requirements. The packaging requirements should be as shown on figure 5 in 5.1.

5.3.8 Section 6, notes. Section 6 should appear as shown on figure 5 and the guidance in 4.2.7 as specified herein.

5.3.8.1 Intended use. The intended use should be as shown on figure 5 in 6.1 and the guidance in 4.2.7.2 as specified herein.

5.3.8.1.1 Replaceability. The replaceability should be as shown on figure 5 in 6.1.1.

5.3.8.1.2 Substitutability. The substitutability should be as shown on figure 5 in 6.1.2.

5.3.8.2 Configuration control of SMD's. The configuration control of SMD's should be as shown on figure 5 in 6.2.

5.3.8.3 Record of users. The record of users should be as shown on figure 5 in 6.3.

5.3.8.4 Comments. The comments should be as shown on figure 5 in 6.4.

5.3.8.5 Abbreviations, symbols, and definitions. The abbreviations, symbols, and definitions should be as shown on figure 5 in 6.5.

5.3.8.6 Sources of supply. The sources of supply paragraph should be as shown on figure 5 in 6.7.

6. NOTES

6.1 Intended use. The issue of SMD's is intended to minimize the proliferation of duplicate drawings for an item of supply. The use of one drawing for an item of supply within DoD is the objective of the SMD program. SMD's are currently applicable to the acquisition of microcircuits only.

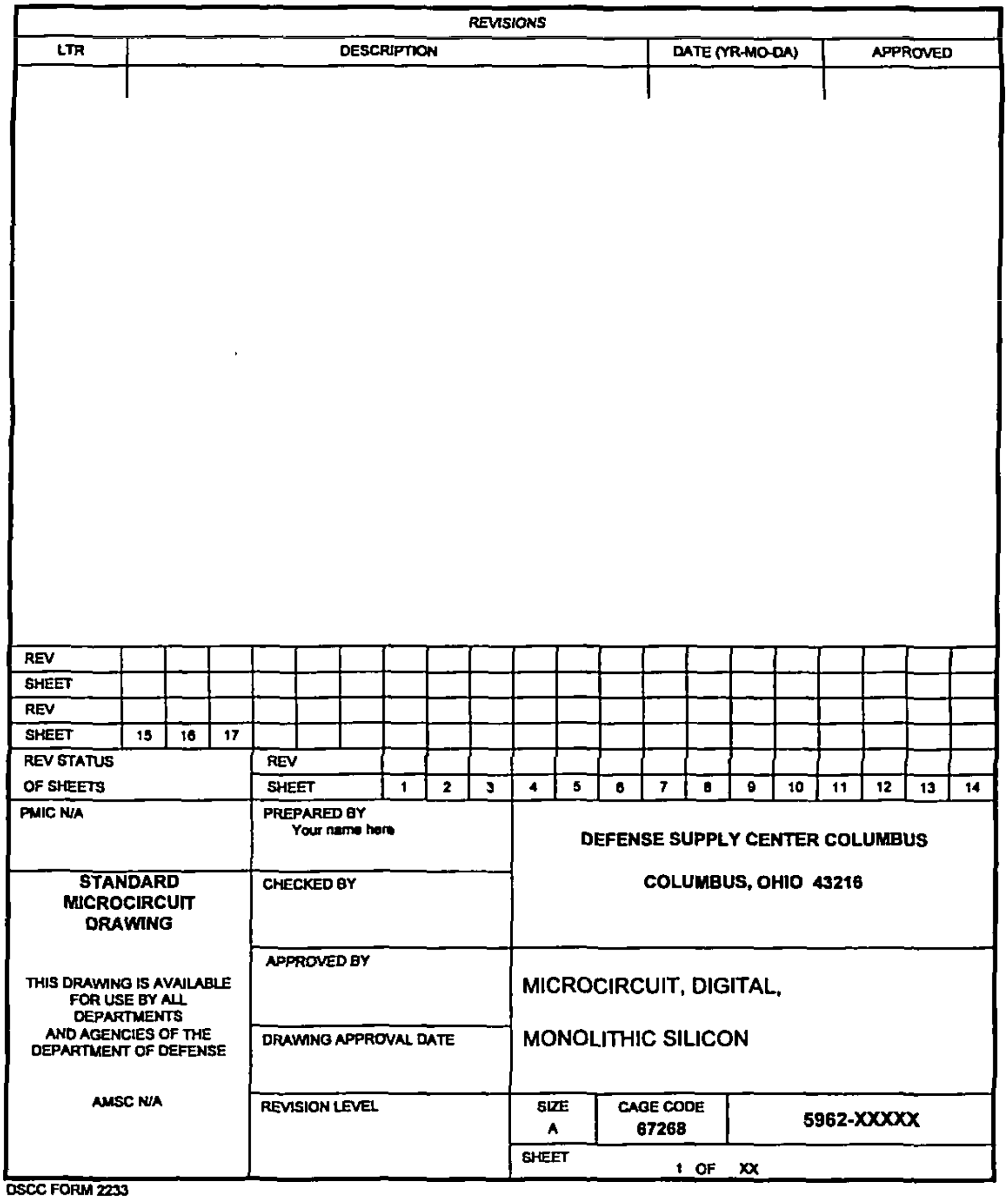
6.1.1 Standard microcircuit drawing program (SMDP). *The SMDP is related to the Configuration* Management and Parts Control Programs. SMD items are documented as required by MIL-STD-100. Non-standard microcircuits parts approval is obtained through the procedures of MIL-HDBK-965.

6.2 Draft construction. Communication with the MPCAG point of contact for the purpose of draft SMD construction will usually be through use of computer or word processor. Defense Supply Center Columbus, DSCC-VA , should be contacted concerning system capability, and modem and telecommunication compatibility (see figure 4).

6.3 Certificate of compliance. A Certificate of Compliance (C of C) is a document by which an authorized official of the microcircuit manufacturer certifies that the microcircuit being supplied in accordance with the applicable SMD by the vendor meets the item Requirements as stated therein. The C of C is delivered by the vendor to the MPCAG with the final SMD.

6.4 Subject term (key word) listing.

Certificate of compliance
Military parts control advisory group
Parts control program
Standard microcircuit drawing
Qualified manufacturers list



REVISIONS			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED

REV																				
SHEET																				
REV																				
SHEET	15	16	17																	
REV STATUS				REV																
OF SHEETS				SHEET			1	2	3	4	5	6	7	8	9	10	11	12	13	14

PMIC N/A	PREPARED BY Your name here	DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216
STANDARD MICROCIRCUIT DRAWING THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE AMSC N/A	CHECKED BY	
	APPROVED BY	MICROCIRCUIT, DIGITAL, MONOLITHIC SILICON
	DRAWING APPROVAL DATE	
	REVISION LEVEL	SIZE A
		CAGE CODE 67268
		5962-XXXXX
		SHEET 1 OF XX

DSCC FORM 2233
APR 97

5962-EXXX

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

FIGURE 1. Drawing, title sheet.

STANDARD **MICROCIRCUIT DRAWING** DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000	SIZE **A**		**5962-XXXXX**
		REVISION LEVEL	SHEET

DSCC FORM 2234
APR 97

FIGURE 2. Drawing, continuation sheet.

DEVICE CLASS M

STANDARD MICROCIRCUIT DRAWING NUMBER ____________________

DSCC-VA Contact ____________________
Telephone: (614)692-

DUE DATE FOR COMPLETED CERTIFICATE and/or COMMENTS ____________________

CERTIFICATE OF COMPLIANCE

MANUFACTURER'S NAME AND LOCATION ____

____

I (We) have reviewed the enclosed drawing and hereby certify that our Hi-Rel/Mil-Temp 883 equivalent product, currently designated as listed below meet the requirements of the SMD (The SMD Part Number includes the drawing number, device type, class designator, case outline, and lead finish designator):

SMD Part Number	Vendor Part Number

Use a C of C Continuation Sheet if more than 10 part numbers are on the SMD.

and fabricated, assembled and tested at our plant(s) located in:

Fabrication location(s) : ____________________

Assembly location(s): ____________________

Test location(s): ____________________

PART MEETS OR EXCEEDS THE PERFORMANCE REQUIREMENT EITHER:

☐ as proposed, or

☐ with essential comments as marked on draft, or

☐ no interest in this drawing.

PART COMPLIES WITH MIL-STD-883 PARAGRAPH 1.2.1 ☐ YES ☐ NO

BURN-IN CIRCUIT IS UNDER DOCUMENT CONTROL AND AVAILABLE UPON REQUEST ☐ YES ☐ NO

THESE DEVICES MEET OR EXCEED THE FOLLOWING RHA LEVEL: ____________

BIASING TEST CIRCUIT ATTACHED *(for RHA tested devices only)* ☐ YES ☐ NO

ESD CLASS and VOLTAGE (from testing or justification): ____________

I (We) understand that this certificate is not to be used nor construed as a guarantee of continued or indefinite availability as an Approved Source for the described drawing item. I further understand that this certificate does not relieve this company from conducting the required testing and lot record keeping detailed in the Standard Microcircuit Drawing. I further agree that our company will furnish a separate certificate of conformance in company format, pertaining to actual lot date codes shipped.

____
Authorized Signature(s)

____
Date

____
Name and Title of Authorizing Official (shall be typed)
(see attached for authorization criteria)

(   )   -
Telephone

This dated C of C (1 Aug 1996) shall not be modified.
Modification will result in nonacceptance.

FIGURE 3. Certificate of compliance.

Authorization Criteria
Standard Microcircuit Drawing
Certificate of Compliance
Dated 1 Aug 1996

The authorized signature shall provide certification signed by the corporate officer responsible for the production of the C of C *described product. The responsible corporate officer may* delegate authority to sign the C of C to specific individuals within the cognizant quality assurance organization. However, the corporate officer retains responsibility for the accuracy of the C of C.

When authority to sign a C of C is delegated, the responsible corporate office shall submit a letter to DSCC-VA which identifies the name, address, phone number and title of the individual having been granted signature authority.

FIGURE 3. Certificate of compliance. - Continued.

FOR DEVICE CLASSES N, Q, or V

STANDARD MICROCIRCUIT DRAWING NUMBER

DSCC-VA Contact ____________
Telephone: (614)692-

DUE DATE FOR COMPLETED CERTIFICATE and/or COMMENTS ____________

CERTIFICATE OF COMPLIANCE

I (We) have reviewed the enclosed drawing and hereby certify that our MIL-PRF-38535 compliant device(s), listed below meet the requirements of the SMD (The SMD Part Number includes the drawing number, rad hard designator, device type, class designator, case outline, and lead finish designator):

SMD Part Number	Vendor Part Number

(Use a C of C Continuation Sheet if more than 5 part numbers are on the SMD.)

MANUFACTURER'S NAME, LOCATION AND CAGE CODE ____________

____

and fabricated, assembled and tested at our plant(s) located in:

Fabrication location(s) : ____________

Assembly location(s): ____________

Test location(s): ____________

PART MEETS OR EXCEEDS THE PERFORMANCE REQUIREMENT EITHER:

☐ as proposed, or

☐ with essential comments as marked on draft

PART HAS COMPLETED CONVERSION OF CUSTOMER REQUIREMENTS AND IS COVERED BY CERTIFICATION AND QUALIFICATION TO MIL-PRF-38535. ____________ ☐ YES ☐ NO

DEVICE CLASS LEVEL ☐ N ☐ Q ☐ V

BURN-IN CIRCUIT IS UNDER DOCUMENT CONTROL AND AVAILABLE UPON REQUEST ☐ YES ☐ NO

THESE DEVICES MEET OR EXCEED THE FOLLOWING RHA ABSOLUTE MAXIMUM TEST VALUES: ____________

BIASING TEST CIRCUIT ATTACHED (for RHA tested devices only) ☐ YES ☐ NO

ESD CLASS and VOLTAGE: ____________

I (We) understand that this certificate is not to be used nor construed as a guarantee of continued or indefinite availability as an Approved Source for the described drawing item. I further understand that this certificate does not relieve this company from conducting the required testing and lot record keeping detailed in the Standard Microcircuit Drawing. I further agree that our company will furnish a separate certificate of conformance in company format, pertaining to actual lot date codes shipped.

____________ Authorized Signature(s)

____________ Date

Name and Title of Authorizing Official (shall be typed)

( ) - ____________ Telephone

Submittal of this information to DSCC-VA does not relieve the device manufacturer of the requirements of MIL-PRF-38535. This dated C of C form (14 Jan 1997) shall not be modified. Modification will result in nonacceptance.

FIGURE 3. Certificate of compliance. - Continued.

SMD PREPARATION FLOWCHART

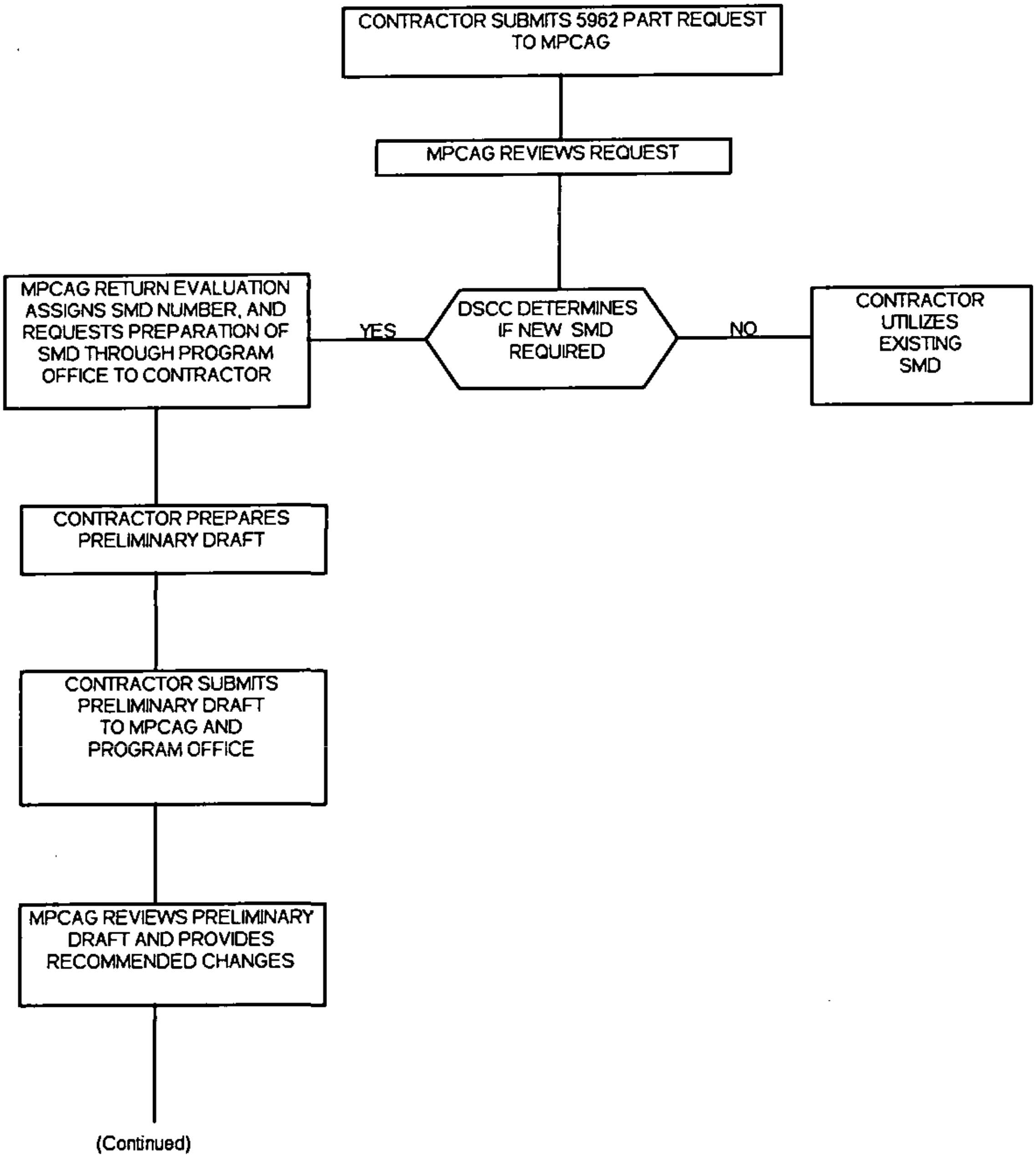


FIGURE 4. SMD preparation flowchart.

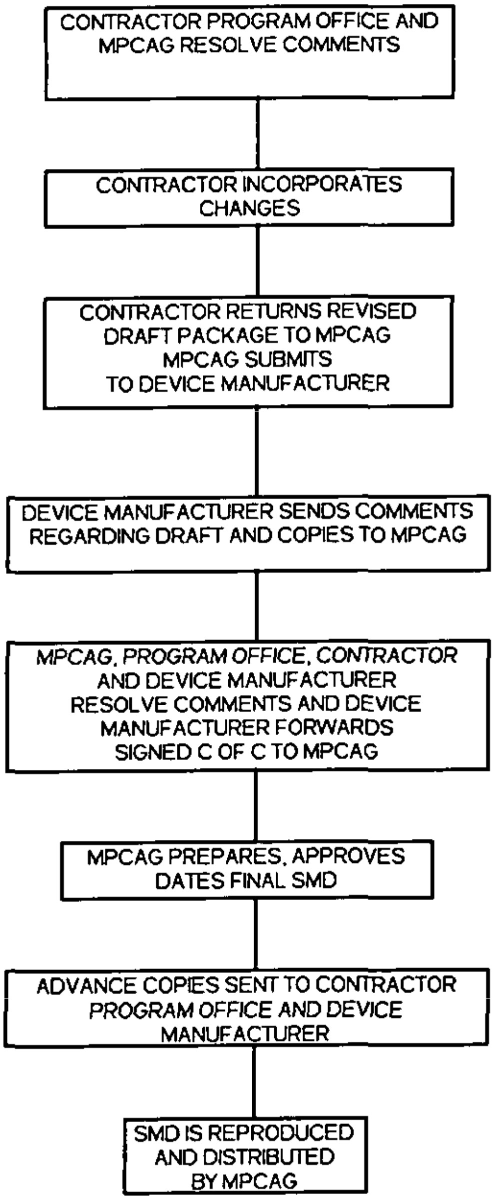
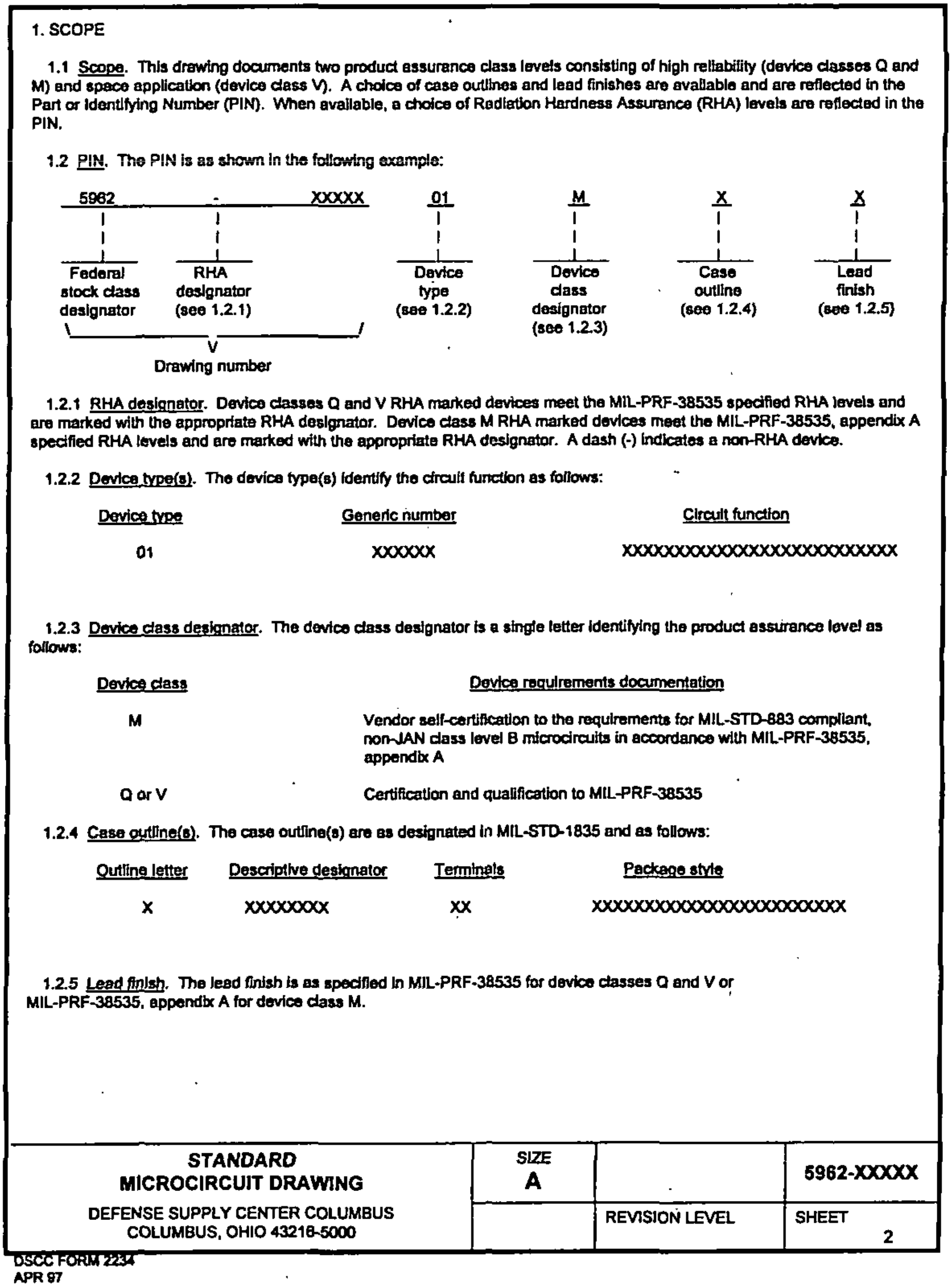


FIGURE 4. SMD preparation flowchart - Continued.



1. SCOPE

1.1 Scope. This drawing documents two product assurance class levels consisting of high reliability (device classes Q and M) and space application (device class V). A choice of case outlines and lead finishes are available and are reflected in the Part or Identifying Number (PIN). When available, a choice of Radiation Hardness Assurance (RHA) levels are reflected in the PIN.

1.2 PIN. The PIN is as shown in the following example:

5962	-	XXXXX	01	M	X	X
Federal stock class designator	RHA designator (see 1.2.1)		Device type (see 1.2.2)	Device class designator (see 1.2.3)	Case outline (see 1.2.4)	Lead finish (see 1.2.5)

________ V ________
Drawing number

1.2.1 RHA designator. Device classes Q and V RHA marked devices meet the MIL-PRF-38535 specified RHA levels and are marked with the appropriate RHA designator. Device class M RHA marked devices meet the MIL-PRF-38535, appendix A specified RHA levels and are marked with the appropriate RHA designator. A dash (-) indicates a non-RHA device.

1.2.2 Device type(s). The device type(s) identify the circuit function as follows:

Device type	Generic number	Circuit function
01	XXXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXX

1.2.3 Device class designator. The device class designator is a single letter identifying the product assurance level as follows:

Device class	Device requirements documentation
M	Vendor self-certification to the requirements for MIL-STD-883 compliant, non-JAN class level B microcircuits in accordance with MIL-PRF-38535, appendix A
Q or V	Certification and qualification to MIL-PRF-38535

1.2.4 Case outline(s). The case outline(s) are as designated in MIL-STD-1835 and as follows:

Outline letter	Descriptive designator	Terminals	Package style
X	XXXXXXXX	XX	XXXXXXXXXXXXXXXXXXXXXXXXX

1.2.5 *Lead finish*. The lead finish is as specified in MIL-PRF-38535 for device classes Q and V or MIL-PRF-38535, appendix A for device class M.

STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000	SIZE A		5962-XXXXX
		REVISION LEVEL	SHEET 2

DSCC FORM 2234
APR 97

FIGURE 5. SMD with boilerplate.

1.3 Absolute maximum ratings. 1/

1.4 Recommended operating conditions.

1.5 Digital logic testing for device classes Q and V.

Fault coverage measurement of manufacturing
logic tests (MIL-STD-883, test method 5012)..XX percent 2/

2. APPLICABLE DOCUMENTS

2.1 Government specification, standards, and handbooks. The following specification, standards, and handbooks form a part of this drawing to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

SPECIFICATION

DEPARTMENT OF DEFENSE

MIL-PRF-38535 - Integrated Circuits, Manufacturing, General Specification for.

STANDARDS

DEPARTMENT OF DEFENSE

MIL-STD-883 - Test Methods and Procedures for Microelectronics.
MIL-STD-973 - Configuration Management.
MIL-STD-1835 - Microcircuit Case Outlines.

HANDBOOKS

DEPARTMENT OF DEFENSE

MIL-HDBK-103 - List of Standard Microcircuit Drawings (SMD's).
MIL-HDBK-780 - Standard Microcircuit Drawings.

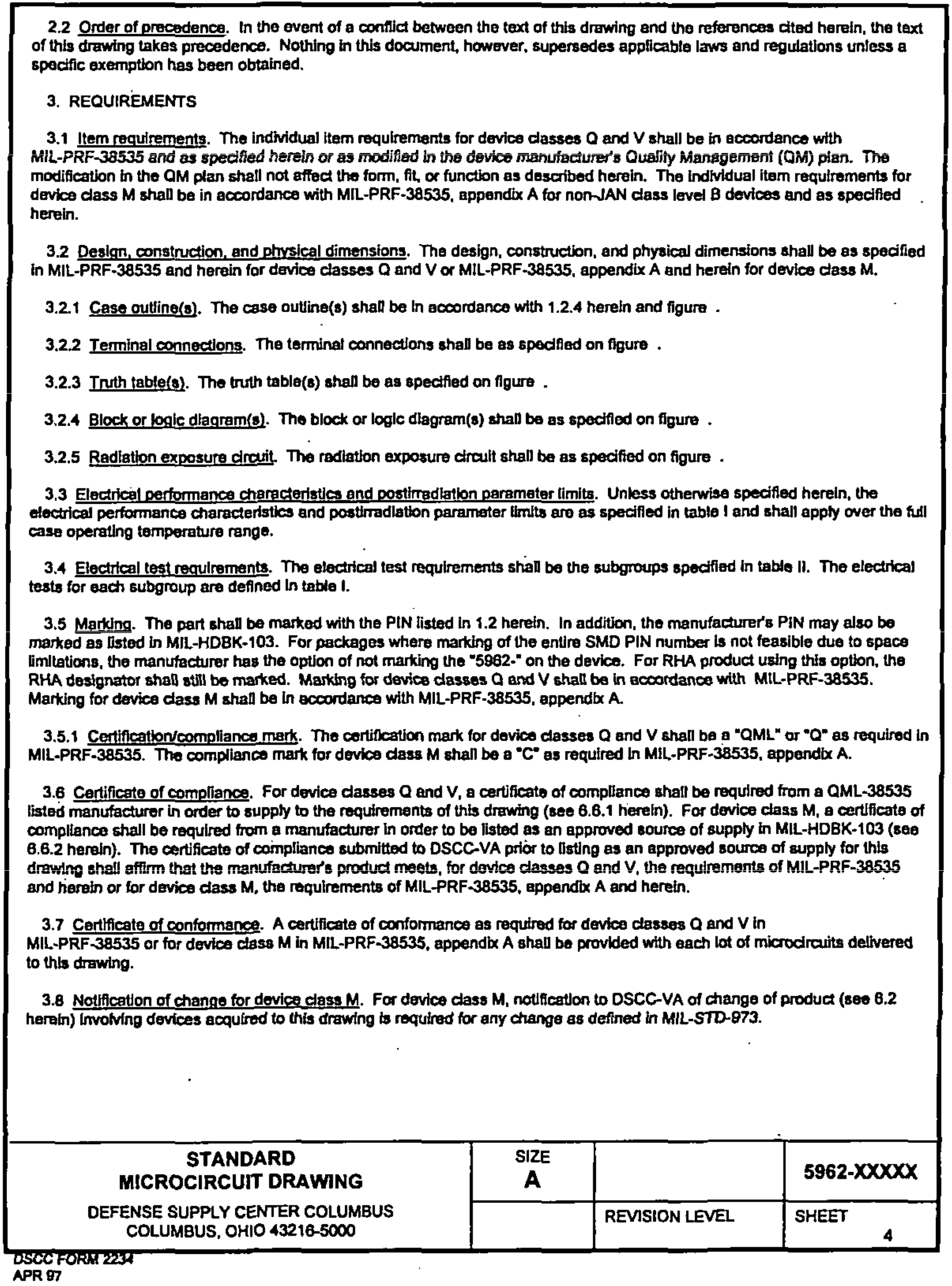
(Unless otherwise indicated, copies of the specification, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

1/ Stresses above the absolute maximum rating may cause permanent damage to the device. Extended operation at the maximum levels may degrade performance and affect reliability.
2/ Values will be added when they become available.

STANDARD MICROCIRCUIT DRAWING	SIZE **A**		**5962-XXXXX**
DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000		REVISION LEVEL	SHEET 3

DSCC FORM 2234
APR 97

FIGURE 5. SMD with boilerplate - Continued.



2.2 Order of precedence. In the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements for device classes Q and V shall be in accordance with MIL-PRF-38535 and as specified herein or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not affect the form, fit, or function as described herein. The individual item requirements for device class M shall be in accordance with MIL-PRF-38535, appendix A for non-JAN class level B devices and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-PRF-38535 and herein for device classes Q and V or MIL-PRF-38535, appendix A and herein for device class M.

3.2.1 Case outline(s). The case outline(s) shall be in accordance with 1.2.4 herein and figure .

3.2.2 Terminal connections. The terminal connections shall be as specified on figure .

3.2.3 Truth table(s). The truth table(s) shall be as specified on figure .

3.2.4 Block or logic diagram(s). The block or logic diagram(s) shall be as specified on figure .

3.2.5 Radiation exposure circuit. The radiation exposure circuit shall be as specified on figure .

3.3 Electrical performance characteristics and postirradiation parameter limits. Unless otherwise specified herein, the electrical performance characteristics and postirradiation parameter limits are as specified in table I and shall apply over the full case operating temperature range.

3.4 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table II. The electrical tests for each subgroup are defined in table I.

3.5 Marking. The part shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's PIN may also be marked as listed in MIL-HDBK-103. For packages where marking of the entire SMD PIN number is not feasible due to space limitations, the manufacturer has the option of not marking the "5962-" on the device. For RHA product using this option, the RHA designator shall still be marked. Marking for device classes Q and V shall be in accordance with MIL-PRF-38535. Marking for device class M shall be in accordance with MIL-PRF-38535, appendix A.

3.5.1 Certification/compliance mark. The certification mark for device classes Q and V shall be a "QML" or "Q" as required in MIL-PRF-38535. The compliance mark for device class M shall be a "C" as required in MIL-PRF-38535, appendix A.

3.6 Certificate of compliance. For device classes Q and V, a certificate of compliance shall be required from a QML-38535 listed manufacturer in order to supply to the requirements of this drawing (see 6.6.1 herein). For device class M, a certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in MIL-HDBK-103 (see 6.6.2 herein). The certificate of compliance submitted to DSCC-VA prior to listing as an approved source of supply for this drawing shall affirm that the manufacturer's product meets, for device classes Q and V, the requirements of MIL-PRF-38535 and herein or for device class M, the requirements of MIL-PRF-38535, appendix A and herein.

3.7 Certificate of conformance. A certificate of conformance as required for device classes Q and V in MIL-PRF-38535 or for device class M in MIL-PRF-38535, appendix A shall be provided with each lot of microcircuits delivered to this drawing.

3.8 Notification of change for device class M. For device class M, notification to DSCC-VA of change of product (see 6.2 herein) involving devices acquired to this drawing is required for any change as defined in MIL-STD-973.

STANDARD MICROCIRCUIT DRAWING	SIZE **A**		**5962-XXXXX**
DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000		REVISION LEVEL	SHEET 4

DSCC FORM 2234
APR 97

FIGURE 5. SMD with boilerplate - Continued.

3.9 Verification and review for device class M. For device class M, DSCC, DSCC's agent, and the acquiring activity retain the option to review the manufacturer's facility and applicable required documentation. Offshore documentation shall be made available onshore at the option of the reviewer.

3.10 Microcircuit group assignment for device class M. Device class M devices covered by this drawing shall be in microcircuit group number xxx (see MIL-PRF-38535, appendix A).

STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000	SIZE **A**		**5962-XXXXX**
		REVISION LEVEL	SHEET 5

DSCC FORM 2234
APR 97

FIGURE 5. SMD with boilerplate - Continued.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions -55°C ≤ T_C ≤+125°C unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	

See footnotes at end of table.

STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000	SIZE **A**		**5962-XXXXX**
		REVISION LEVEL	SHEET 6

DSCC FORM 2234
APR 97

FIGURE 5. SMD with boilerplate - Continued.

FIGURE 1. Case outline.

STANDARD MICROCIRCUIT DRAWING	SIZE **A**		**5962-XXXXX**
DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000		REVISION LEVEL	SHEET 7

DSCC FORM 2234
APR 97

FIGURE 5. SMD with boilerplate - Continued.

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and Inspection. For device classes Q and V, sampling and inspection procedures shall be in accordance with MIL-PRF-38535 or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not affect the form, fit, or function as described herein. For device class M, sampling and inspection procedures shall be in accordance with MIL-PRF-38535, appendix A.

4.2 Screening. For device classes Q and V, screening shall be in accordance with MIL-PRF-38535, and shall be conducted on all devices prior to qualification and technology conformance inspection. For device class M, screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection.

4.2.1 Additional criteria for device class M.

a. Burn-in test, method 1015 of MIL-STD-883.

(1) Test condition or . The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing or acquiring activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015.

(2) T_A = +125°C, minimum.

b. Interim and final electrical test parameters shall be as specified in table II herein.

4.2.2 Additional criteria for device classes Q and V.

a. The burn-in test duration, test condition and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The burn-in test circuit shall be maintained under document revision level control of the device manufacturer's Technology Review Board (TRB) in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015 of MIL-STD-883.

b. Interim and final electrical test parameters shall be as specified in table II herein.

c. Additional screening for device class V beyond the requirements of device class Q shall be as specified in MIL-PRF-38535, appendix B.

4.3 Qualification inspection for device classes Q and V. Qualification inspection for device classes Q and V shall be in accordance with MIL-PRF-38535. Inspections to be performed shall be those specified in MIL-PRF-38535 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.4).

4.4 Conformance inspection. Technology conformance inspection for classes Q and V shall be in accordance with MIL-PRF-38535 including groups A, B, C, D, and E inspections and as specified herein except where option 2 of MIL-PRF-38535 permits alternate in-line control testing. Quality conformance inspection for device class M shall be in accordance with MIL-PRF-38535, appendix A and as specified herein. Inspections to be performed for device class M shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.4).

STANDARD MICROCIRCUIT DRAWING	SIZE **A**		**5962-XXXXX**
DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000		REVISION LEVEL	SHEET 12

DSCC FORM 2234
APR 97

FIGURE 5. SMD with boilerplate - Continued.

4.4.1 Group A inspection.

a. Tests shall be as specified in table II herein.

b. For device class M, subgroups 7 and 8 tests shall be sufficient to verify the truth table. For device classes Q and V, subgroups 7 and 8 shall include verifying the functionality of the device; these tests shall have been fault graded in accordance with MIL-STD-883, test method 5012 (see 1.5 herein).

TABLE II. Electrical test requirements.

Test requirements	Subgroups (in accordance with MIL-STD-883, method 5005, table I)	Subgroups (in accordance with MIL-PRF-38535, table III)	
	Device class M	Device class Q	Device class V
Interim electrical parameters (see 4.2)			
Final electrical parameters (see 4.2)	1/	1/	2/
Group A test requirements (see 4.4)			
Group C end-point electrical parameters (see 4.4)			
Group D end-point electrical parameters (see 4.4)			
Group E end-point electrical parameters (see 4.4)			

1/ PDA applies to subgroup 1.
2/ PDA applies to subgroups 1 and 7.

4.4.2 Group C inspection. The group C inspection end-point electrical parameters shall be as specified in table II herein.

4.4.2.1 Additional criteria for device class M. Steady-state life test conditions, method 1005 of MIL-STD-883:

a. Test condition or . The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing or acquiring activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005 of MIL-STD-883.

b. T_A = +125°C, minimum.

c. Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000	SIZE **A**		**5962-XXXXX**
		REVISION LEVEL	SHEET 13

DSCC FORM 2234
APR 97

FIGURE 5. SMD with boilerplate - Continued.

4.4.2.2 Additional criteria for device classes Q and V. The steady-state life test duration, test condition and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The test circuit shall be maintained under document revision level control by the device manufacturer's TRB in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005 of MIL-STD-883.

4.4.3 Group D inspection. The group D inspection end-point electrical parameters shall be as specified in table II herein.

4.4.4 Group E inspection. Group E inspection is required only for parts intended to be marked as radiation hardness assured (see 3.5 herein).

a. End-point electrical parameters shall be as specified in table II herein.

b. For device classes Q and V, the devices or test vehicle shall be subjected to radiation hardness assured tests as specified in MIL-PRF-38535 for the RHA level being tested. For device class M, the devices shall be subjected to radiation hardness assured tests as specified in MIL-PRF-38535, appendix A for the RHA level being tested. All device classes must meet the postirradiation end-point electrical parameter limits as defined in table I at T_A = +25°C ±5°C, after exposure, to the subgroups specified in table II herein.

c. When specified in the purchase order or contract, a copy of the RHA delta limits shall be supplied.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-PRF-38535 for device classes Q and V or MIL-PRF-38535, appendix A for device class M.

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use for Government microcircuit applications (original equipment), design applications, and logistics purposes.

6.1.1 Replaceability. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.

6.1.2 Substitutability. Device class Q devices will replace device class M devices.

6.2 Configuration control of SMD's. All proposed changes to existing SMD's will be coordinated with the users of record for the individual documents. This coordination will be accomplished in accordance with MIL-STD-973 using DD Form 1692, Engineering Change Proposal.

6.3 Record of users. Military and industrial users should inform Defense Supply Center Columbus when a system application requires configuration control and which SMD's are applicable to that system. DSCC will maintain a record of users and this list will be used for coordination and distribution of changes to the drawings. Users of drawings covering microelectronic devices (FSC 5962) should contact DSCC-VA, telephone (614) 692-0525.

6.4 Comments. Comments on this drawing should be directed to DSCC-VA , Columbus, Ohio 43216-5000, or telephone (614) 692-0674.

6.5 Abbreviations, symbols, and definitions. The abbreviations, symbols, and definitions used herein are defined in MIL-PRF-38535 and MIL-HDBK-1331.

STANDARD MICROCIRCUIT DRAWING	SIZE **A**		**5962-XXXXX**
DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000		REVISION LEVEL	SHEET 14

DSCC FORM 2234
APR 97

FIGURE 5. SMD with boilerplate - Continued.

6.6 Sources of supply.

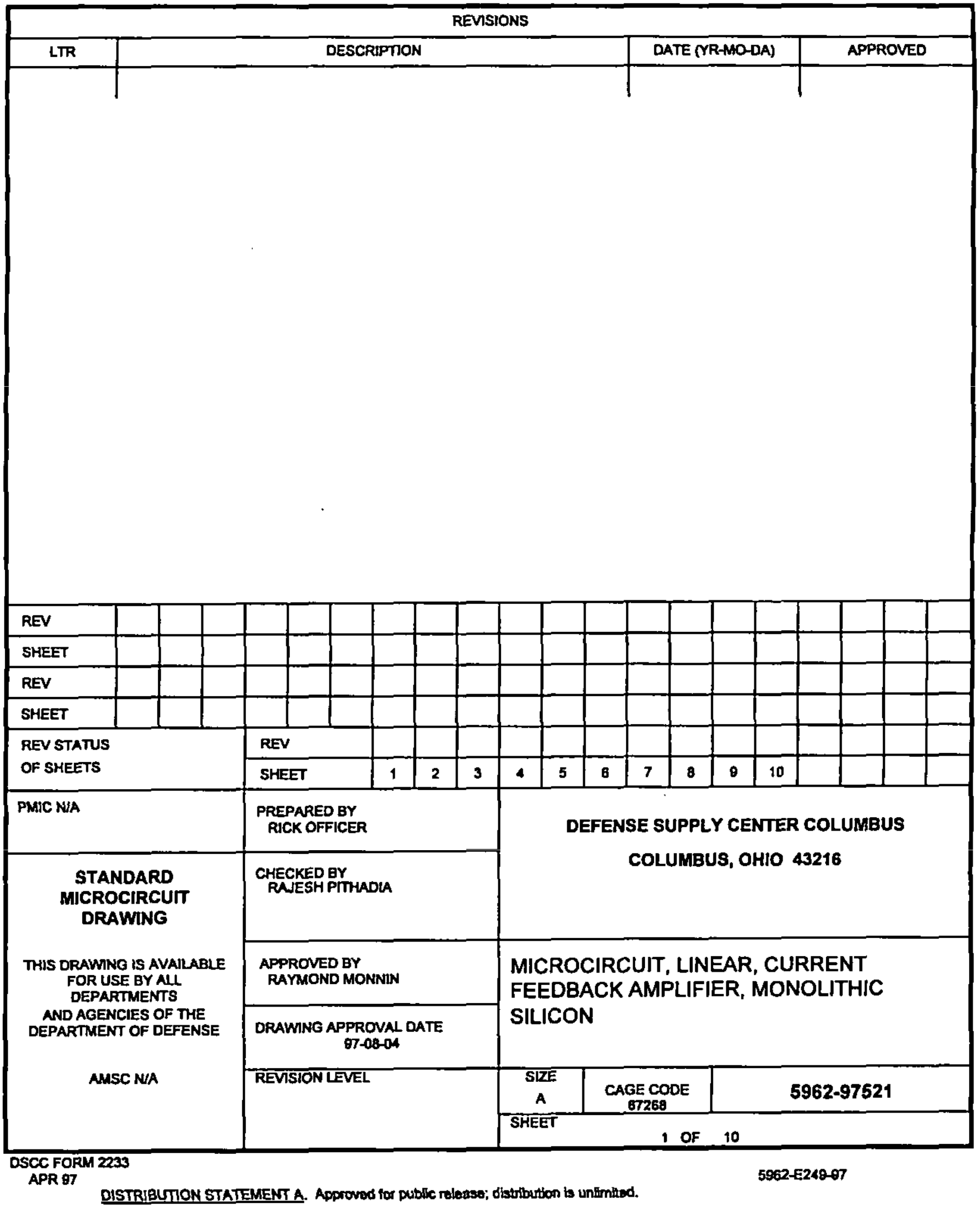
6.6.1 Sources of supply for device classes Q and V. Sources of supply for device classes Q and V are listed in QML-38535. The vendors listed in QML-38535 have submitted a certificate of compliance (see 3.6 herein) to DSCC-VA and have agreed to this drawing.

6.6.2 Approved sources of supply for device class M. Approved sources of supply for class M are listed in MIL-HDBK-103. The vendors listed in MIL-HDBK-103 have agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DSCC-VA.

STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-5000	SIZE **A**		**5962-XXXXX**
		REVISION LEVEL	SHEET 15

DSCC FORM 2234
APR 97

FIGURE 5. SMD with boilerplate - Continued.



REVISIONS

LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED

REV																					
SHEET																					
REV																					
SHEET																					

REV STATUS OF SHEETS	REV																
	SHEET	1	2	3	4	5	6	7	8	9	10						

PMIC N/A

PREPARED BY
RICK OFFICER

DEFENSE SUPPLY CENTER COLUMBUS

COLUMBUS, OHIO 43216

STANDARD MICROCIRCUIT DRAWING

THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE

AMSC N/A

CHECKED BY
RAJESH PITHADIA

APPROVED BY
RAYMOND MONNIN

DRAWING APPROVAL DATE
97-08-04

REVISION LEVEL

MICROCIRCUIT, LINEAR, CURRENT FEEDBACK AMPLIFIER, MONOLITHIC SILICON

SIZE	CAGE CODE	
A	67268	**5962-97521**

SHEET 1 OF 10

DSCC FORM 2233
APR 97

5962-E249-97

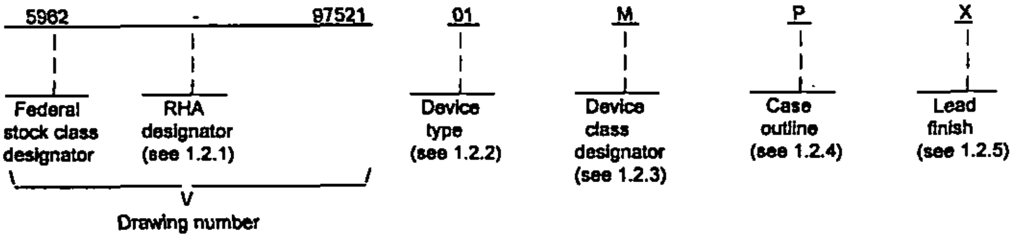
DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

FIGURE 6. Sample SMD.

1. SCOPE

1.1 Scope. This drawing documents two product assurance class levels consisting of high reliability (device classes Q and M) and space application (device class V). A choice of case outlines and lead finishes are available and are reflected in the Part or Identifying Number (PIN). When available, a choice of Radiation Hardness Assurance (RHA) levels are reflected in the PIN.

1.2 PIN. The PIN is as shown in the following example:



1.2.1 RHA designator. Device classes Q and V RHA marked devices meet the MIL-PRF-38535 specified RHA levels and are marked with the appropriate RHA designator. Device class M RHA marked devices meet the MIL-PRF-38535, appendix A specified RHA levels and are marked with the appropriate RHA designator. A dash (-) indicates a non-RHA device.

1.2.2 Device type(s). The device type(s) identify the circuit function as follows:

Device type	Generic number	Circuit function
01	CLC452	Single supply, low power, high output, current feedback amplifier

1.2.3 Device class designator. The device class designator is a single letter identifying the product assurance level as follows:

Device class	Device requirements documentation
M	Vendor self-certification to the requirements for MIL-STD-883 compliant, non-JAN class level B microcircuits in accordance with MIL-PRF-38535, appendix A
Q or V	Certification and qualification to MIL-PRF-38535

1.2.4 Case outline(s). The case outline(s) are as designated in MIL-STD-1835 and as follows:

Outline letter	Descriptive designator	Terminals	Package style
P	GDIP1-T8 or CDIP2-T8	8	Dual-in-line

1.2.5 Lead finish. The lead finish is as specified in MIL-PRF-38535 for device classes Q and V or MIL-PRF-38535, appendix A for device class M.

STANDARD MICROCIRCUIT DRAWING	SIZE A		5962-97521
DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000		REVISION LEVEL	SHEET 2

DSCC FORM 2234
APR 97

FIGURE 6. Sample SMD - Continued.

1.3 Absolute maximum ratings. 1/

Supply voltage (V_{CC}) .... ±7 V
Output current (I_{OUT}) .... ±140 mA
Common mode input voltage .... V_{EE} to V_{CC}
Differential input voltage .... ±1 V
Power dissipation (P_D) .... 38 mW
Lead temperature (soldering, 10 seconds) .... +300°C
Junction temperature (T_J) .... +175°C
Storage temperature range .... -65°C to +150°C
Thermal resistance, junction-to-case (Θ_{JC}) .... 70°C/W
Thermal resistance, junction-to-ambient (Θ_{JA}) .... 215°C/W

1.4 Recommended operating conditions.

Supply voltage (V_{CC}) .... $5 V < (V_{CC} - V_{EE}) < 10 V$
Gain range .... ±1 to ±10
Ambient operating temperature range (T_A) .... -55°C to +125°C

2. APPLICABLE DOCUMENTS

2.1 Government specification, standards, and handbooks. The following specification, standards, and handbooks form a part of this drawing to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

SPECIFICATION

MILITARY

MIL-PRF-38535 - Integrated Circuits, Manufacturing, General Specification for.

STANDARDS

MILITARY

MIL-STD-883 - Test Methods and Procedures for Microelectronics.
MIL-STD-973 - Configuration Management.
MIL-STD-1835 - Microcircuit Case Outlines.

HANDBOOKS

MILITARY

MIL-HDBK-103 - List of Standard Microcircuit Drawings (SMD's).
MIL-HDBK-780 - Standard Microcircuit Drawings.

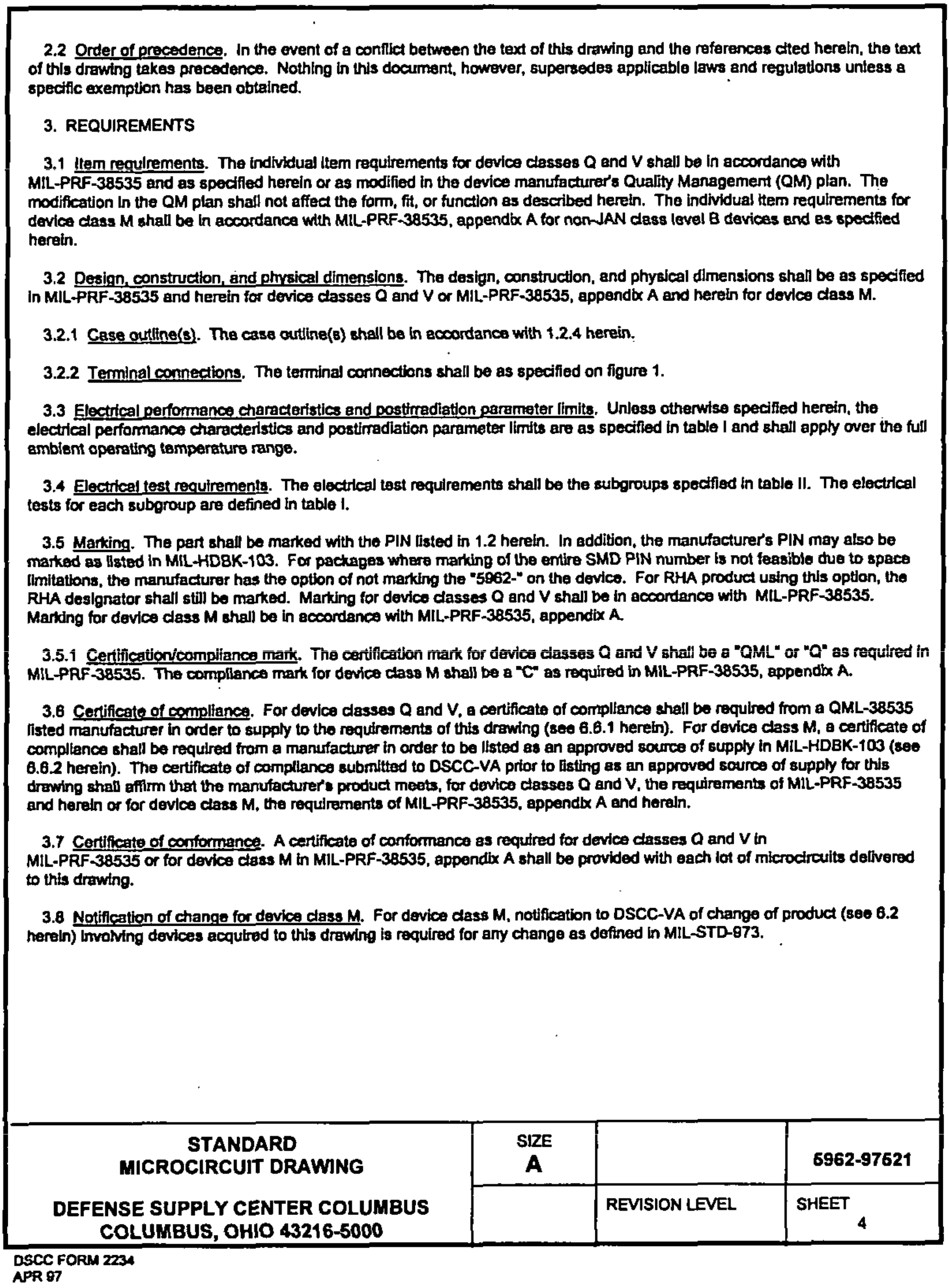
(Unless otherwise indicated, copies of the specification, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

1/ Stresses above the absolute maximum rating may cause permanent damage to the device. Extended operation at the maximum levels may degrade performance and affect reliability.

STANDARD MICROCIRCUIT DRAWING	SIZE A		5962-97521
DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000		REVISION LEVEL	SHEET 3

DSCC FORM 2234
APR 97

FIGURE 6. Sample SMD - Continued.



2.2 Order of precedence. In the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements for device classes Q and V shall be in accordance with MIL-PRF-38535 and as specified herein or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not affect the form, fit, or function as described herein. The individual item requirements for device class M shall be in accordance with MIL-PRF-38535, appendix A for non-JAN class level B devices and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-PRF-38535 and herein for device classes Q and V or MIL-PRF-38535, appendix A and herein for device class M.

3.2.1 Case outline(s). The case outline(s) shall be in accordance with 1.2.4 herein.

3.2.2 Terminal connections. The terminal connections shall be as specified on figure 1.

3.3 Electrical performance characteristics and postirradiation parameter limits. Unless otherwise specified herein, the electrical performance characteristics and postirradiation parameter limits are as specified in table I and shall apply over the full ambient operating temperature range.

3.4 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table II. The electrical tests for each subgroup are defined in table I.

3.5 Marking. The part shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's PIN may also be marked as listed in MIL-HDBK-103. For packages where marking of the entire SMD PIN number is not feasible due to space limitations, the manufacturer has the option of not marking the "5962-" on the device. For RHA product using this option, the RHA designator shall still be marked. Marking for device classes Q and V shall be in accordance with MIL-PRF-38535. Marking for device class M shall be in accordance with MIL-PRF-38535, appendix A.

3.5.1 Certification/compliance mark. The certification mark for device classes Q and V shall be a "QML" or "Q" as required in MIL-PRF-38535. The compliance mark for device class M shall be a "C" as required in MIL-PRF-38535, appendix A.

3.6 Certificate of compliance. For device classes Q and V, a certificate of compliance shall be required from a QML-38535 listed manufacturer in order to supply to the requirements of this drawing (see 6.6.1 herein). For device class M, a certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in MIL-HDBK-103 (see 6.6.2 herein). The certificate of compliance submitted to DSCC-VA prior to listing as an approved source of supply for this drawing shall affirm that the manufacturer's product meets, for device classes Q and V, the requirements of MIL-PRF-38535 and herein or for device class M, the requirements of MIL-PRF-38535, appendix A and herein.

3.7 Certificate of conformance. A certificate of conformance as required for device classes Q and V in MIL-PRF-38535 or for device class M in MIL-PRF-38535, appendix A shall be provided with each lot of microcircuits delivered to this drawing.

3.8 Notification of change for device class M. For device class M, notification to DSCC-VA of change of product (see 6.2 herein) involving devices acquired to this drawing is required for any change as defined in MIL-STD-973.

STANDARD MICROCIRCUIT DRAWING	SIZE A		5962-97521
DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000		REVISION LEVEL	SHEET 4

DSCC FORM 2234
APR 97

FIGURE 6. Sample SMD - Continued.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ $-55°C \leq T_A \leq +125°C$ unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Input offset voltage	V_{IO}	$V_{CC} = \pm 2.5$ V	1	01	-4	4	mV
			2,3		-6	6	
		$V_{CC} = \pm 5$ V	1		-6	6	
			2,3		-8	8	
Non-inverting bias current	I_{BN}	$V_{CC} = \pm 2.5$ V	1	01	-18	18	µA
			2,3		-24	24	
		$V_{CC} = \pm 5$ V	1		-18	18	
			2,3		-25	25	
Inverting bias current	I_{BI}	$V_{CC} = \pm 2.5$ V	1	01	-14	14	µA
			2,3		-17	17	
		$V_{CC} = \pm 5$ V	1		-19	19	
			2,3		-22	22	
Supply current	I_{CC}	$V_{CC} = \pm 2.5$ V	1	01		3.4	mA
			2,3			3.6	
		$V_{CC} = \pm 5$ V	1			3.8	
			2,3			4	
Power supply rejection ratio	PSRR	$V_{CC} = \pm 2.5$ V	4	01	48		dB
			5,6		46		
Small signal bandwidth	SSBW	$V_{CC} = \pm 2.5$ V	4	01	100		MHz
		$V_{OUT} < 0.5$ V_{PP}	5,6		85		
		$V_{CC} = \pm 5$ V	4		135		
		$V_{OUT} < 1.0$ V_{PP}	5,6		115		

See footnote at end of table.

STANDARD MICROCIRCUIT DRAWING	SIZE **A**		**5962-97521**
DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000		REVISION LEVEL	SHEET 5

DSCC FORM 2234
APR 97

FIGURE 6. Sample SMD - Continued.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions 1/ $-55°C \leq T_A \leq +125°C$ unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Gain flatness peaking	GFPH	$V_{CC} = \pm 2.5$ V, DC to 200 MHz,	4	01		0.5	dB
		$V_{OUT} = 0.5$ Vpp	5,6			1.0	
Gain flatness rolloff	GFRH	$V_{CC} = \pm 2.5$ V, DC to 30 MHz, $V_{OUT} = 0.5$ Vpp	4,5,6	01		0.3	dB
2 nd harmonic distortion	HD2	$V_{CC} = \pm 2.5$ V,	4	01		-58	dBc
		2 Vpp, 5 MHz	5,6			-56	
3 rd harmonic distortion	HD3	$V_{CC} = \pm 2.5$ V,	4	01		-55	dBc
		2 Vpp, 5 MHz	5,6			-53	

1/ Unless otherwise specified, load resistance (R_L) = 100 Ω, feedback resistance (R_F) = 1 kΩ, gain resistance (R_G) = 1 kΩ, and gain (A_V) = +2.

3.9 Verification and review for device class M. For device class M, DSCC, DSCC's agent, and the acquiring activity retain the option to review the manufacturer's facility and applicable required documentation. Offshore documentation shall be made available onshore at the option of the reviewer.

3.10 Microcircuit group assignment for device class M. Device class M devices covered by this drawing shall be in microcircuit group number 49 (see MIL-PRF-38535, appendix A).

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. For device classes Q and V, sampling and inspection procedures shall be in accordance with MIL-PRF-38535 or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not affect the form, fit, or function as described herein. For device class M, sampling and inspection procedures shall be in accordance with MIL-PRF-38535, appendix A.

STANDARD MICROCIRCUIT DRAWING	SIZE A		5962-97521
DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000		REVISION LEVEL	SHEET 6

DSCC FORM 2234
APR 97

FIGURE 6. Sample SMD - Continued.

Device type	01
Case outline	P
Terminal number	Terminal symbols
1	NC
2	N_{INV}
3	VNON-INV
4	V_{EE}
5	NC
6	V_{OUT}
7	$+V_{CC}$
8	NC

FIGURE 1. Terminal number.

STANDARD MICROCIRCUIT DRAWING	SIZE A		5962-97521
DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000		REVISION LEVEL	SHEET 7

DSCC FORM 2234
APR 97

FIGURE 6. Sample SMD - Continued.

TABLE II. Electrical test requirements.

Test requirements	Subgroups (in accordance with MIL-STD-883, method 5005, table I)	Subgroups (in accordance with MIL-PRF-38535, table III)	
	Device class M	Device class Q	Device class V
Interim electrical parameters (see 4.2)	1	—	—
Final electrical parameters (see 4.2)	1,2,3,4 1/	1,2,3,4 1/	1,2,3,4 1/
Group A test requirements (see 4.4)	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6
Group C end-point electrical parameters (see 4.4)	1	1	1
Group D end-point electrical parameters (see 4.4)	1	1	1
Group E end-point electrical parameters (see 4.4)	—	—	—

1/ PDA applies to subgroup 1.

4.2 Screening. For device classes Q and V, screening shall be in accordance with MIL-PRF-38535, and shall be conducted on all devices prior to qualification and technology conformance inspection. For device class M, screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection.

4.2.1 Additional criteria for device class M.

a. Burn-in test, method 1015 of MIL-STD-883.

(1) Test condition B. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing or acquiring activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015.

(2) T_A = +125°C, minimum.

b. Interim and final electrical test parameters shall be as specified in table II herein.

STANDARD MICROCIRCUIT DRAWING	SIZE A		5962-97521
DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000		REVISION LEVEL	SHEET 8

DSCC FORM 2234
APR 97

FIGURE 6. Sample SMD - Continued.

4.2.2 Additional criteria for device classes Q and V.

a. The burn-in test duration, test condition and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The burn-in test circuit shall be maintained under document revision level control of the device manufacturer's Technology Review Board (TRB) in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015 of MIL-STD-883.

b. Interim and final electrical test parameters shall be as specified in table II herein.

c. Additional screening for device class V beyond the requirements of device class Q shall be as specified in MIL-PRF-38535, appendix B.

4.3 Qualification inspection for device classes Q and V. Qualification inspection for device classes Q and V shall be in accordance with MIL-PRF-38535. Inspections to be performed shall be those specified in MIL-PRF-38535 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.4).

4.4 Conformance inspection. Technology conformance inspection for classes Q and V shall be in accordance with MIL-PRF-38535 including groups A, B, C, D, and E inspections and as specified herein except where option 2 of MIL-PRF-38535 permits alternate in-line control testing. Quality conformance inspection for device class M shall be in accordance with MIL-PRF-38535, appendix A and as specified herein. Inspections to be performed for device class M shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.4).

4.4.1 Group A inspection.

a. Tests shall be as specified in table II herein.

b. Subgroups 7, 8, 9, 10 and 11 in table I, method 5005 of MIL-STD-883 shall be omitted.

4.4.2 Group C inspection. The group C inspection end-point electrical parameters shall be as specified in table II herein.

4.4.2.1 Additional criteria for device class M. Steady-state life test conditions, method 1005 of MIL-STD-883:

a. Test condition B. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing or acquiring activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005 of MIL-STD-883.

b. T_A = +125°C, minimum.

c. Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

4.4.2.2 Additional criteria for device classes Q and V. The steady-state life test duration, test condition and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The test circuit shall be maintained under document revision level control by the device manufacturer's TRB in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005 of MIL-STD-883.

4.4.3 Group D inspection. The group D inspection end-point electrical parameters shall be as specified in table II herein.

STANDARD MICROCIRCUIT DRAWING	SIZE **A**		**5962-97521**
DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000		REVISION LEVEL	SHEET 9

DSCC FORM 2234
APR 97

FIGURE 6. Sample SMD - Continued.

4.4.4 Group E inspection. Group E inspection is required only for parts intended to be marked as radiation hardness assured (see 3.5 herein).

a. End-point electrical parameters shall be as specified in table II herein.

b. For device classes Q and V, the devices or test vehicle shall be subjected to radiation hardness assured tests as specified in MIL-PRF-38535 for the RHA level being tested. For device class M, the devices shall be subjected to radiation hardness assured tests as specified in MIL-PRF-38535, appendix A for the RHA level being tested. All device classes must meet the postirradiation end-point electrical parameter limits as defined in table I at T_A = +25°C ±5°C, after exposure, to the subgroups specified in table II herein.

c. When specified in the purchase order or contract, a copy of the RHA delta limits shall be supplied.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-PRF-38535 for device classes Q and V or MIL-PRF-38535, appendix A for device class M.

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use for Government microcircuit applications (original equipment), design applications, and logistics purposes.

6.1.1 Replaceability. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.

6.1.2 Substitutability. Device class Q devices will replace device class M devices.

6.2 Configuration control of SMD's. All proposed changes to existing SMD's will be coordinated with the users of record for the individual documents. This coordination will be accomplished in accordance with MIL-STD-973 using DD Form 1692, Engineering Change Proposal.

6.3 Record of users. Military and industrial users should inform Defense Supply Center Columbus when a system application requires configuration control and which SMD's are applicable to that system. DSCC will maintain a record of users and this list will be used for coordination and distribution of changes to the drawings. Users of drawings covering microelectronic devices (FSC 5962) should contact DSCC-VA, telephone (614) 692-0525.

6.4 Comments. Comments on this drawing should be directed to DSCC-VA , Columbus, Ohio 43216-5000, or telephone (614) 692-0674.

6.5 Abbreviations, symbols, and definitions. The abbreviations, symbols, and definitions used herein are defined in MIL-PRF-38535 and MIL-HDBK-1331.

6.6 Sources of supply.

6.6.1 Sources of supply for device classes Q and V. Sources of supply for device classes Q and V are listed in QML-38535. The vendors listed in QML-38535 have submitted a certificate of compliance (see 3.6 herein) to DSCC-VA and have agreed to this drawing.

6.6.2 Approved sources of supply for device class M. Approved sources of supply for class M are listed in MIL-HDBK-103. The vendors listed in MIL-HDBK-103 have agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DSCC-VA.

STANDARD MICROCIRCUIT DRAWING	SIZE A		5962-97521
DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000		REVISION LEVEL	SHEET 10

DSCC FORM 2234
APR 97

FIGURE 6. Sample SMD - Continued.

STANDARD MICROCIRCUIT DRAWING BULLETIN

DATE: 97-08-04

Approved sources of supply for SMD 5962-97521 are listed below for immediate acquisition information only and shall be added to MIL-HDBK-103 during the next revision. MIL-HDBK-103 will be revised to include the addition or deletion of sources. The vendors listed below have agreed to this drawing and a certificate of compliance has been submitted to and accepted by DSCC-VA. This bulletin is superseded by the next dated revision of MIL-HDBK-103.

Standard microcircuit drawing PIN 1/	Vendor CAGE number	Vendor similar PIN 2/
5962-9752101MPA	62839	CLC452A8B

1/ The lead finish shown for each PIN representing a hermetic package is the most readily available from the manufacturer listed for that part. If the desired lead finish is not listed contact the vendor to determine its availability.

2/ Caution. Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.

Vendor CAGE number	Vendor name and address
62839	Comlinear A National Semiconductor Company 4800 Wheaton Drive Fort Collins, CO 80525-9484

The information contained herein is disseminated for convenience only and the Government assumes no liability whatsoever for any inaccuracies in the information bulletin.

FIGURE 6. Sample SMD - Continued.

CONCLUDING MATERIAL

Custodians: Army - CR Navy - EC Air Force - 17	Preparing activity: DLA-CC
Review activities: Army - AR, MI, SM Navy - AS, CG, MC, OS, SH Air Force - 19, 85, 99	(Project 5962-1735)