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MEMORANDUM FOR MILITARY/INDUSTRY DISTRIBUTION

3 September 2004

SUBJECT: Proposed MIL-DTL-83739C  
 Project Number 5985-1323

In addition to being provided with this memorandum, initial draft of the subject document is available for downloading and viewing from the DSCC-VA website:

<http://www.dsccols.com/Programs/MilSpec>  
 or  
<http://www.dscc.dla.mil/Programs/MilSpec/DocSearch.asp>

The attached subject document revision is being proposed. Please review this document and provide concurrence or comments to this office within 45 days. If this document is of interest to you, please type comments on FORM 155B, Compilation of Comments or equivalent. Comments originating from the military departments must be identified as either "Essential" or "Suggested". Essential comments should be supported by data. Military review activities should forward comments to their custodians or this office, as applicable, in sufficient time to allow for consolidating the department reply.

The changes from the previous revision are found on page 2 herein.

Indicate below your interest and FAX, along with FORM 155B, to DSCC-VAT, DSN 850-6939 or commercial 614-692-6939, or e-mail comments to [david.arps@dla.mil](mailto:david.arps@dla.mil).

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## Changes from Previous Revision

Page 1: Heading, distribution statement, and comment block revised in accordance with MIL-STD-961E. Paragraph 2.2.1 deleted inactive DOD Specification MIL-PRF-55110 and inserted replacement MIL-PRF-31032. Changed specification numbers to reflect "DTL", where needed.

Page 3: Paragraph 3.5.4 corrected document references to replace inactive document. Updated document numbers in 3.5.5.1 and 3.5.5.2 to include "DTL".

Page 5: Table I corrected document references.

Page 10: Paragraph 6.4 corrected zip code. Added paragraph 6.7 and re-arranged paragraph 6.6.

Page 11: Added final note in accordance with MIL-STD-961E. Removed DD Form 1424.

NOTE: This draft, dated 3 September 2004 by DLA-CC, has not been approved and is subject to modification. DO NOT USE PRIOR TO APPROVAL. (Project 5985-1323)

INCH-POUND

MIL-DTL-83739C  
DRAFT  
SUPERSEDING  
MIL-DTL-83739B  
15 November 1999

## DETAIL SPECIFICATION

### SWITCHES, ANTENNA, RADIO FREQUENCY, SOLID-STATE, GENERAL SPECIFICATION FOR

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

#### 1. SCOPE

1.1 Scope. This specification covers the general requirements for solid-state antenna switches for use at radio frequencies (see 6.1).

#### 2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification 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 and 4 of this specification, 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 (see 6.3).

#### SPECIFICATIONS

##### DEPARTMENT OF DEFENSE

|               |   |  |
|---------------|---|--|
| MIL-DTL-3643  | - | Connectors, Coaxial, Radio Frequency, Series HN, and Associated Fittings, General Specification For.       |
| MIL-C-5541    | - | Chemical Conversion Coatings on Aluminum and Aluminum Alloys.  |
| MIL-F-14072   | - | Finishes for Ground Based Electronic Equipment.  |
| MIL-PRF-19500 | - | Semiconductor Devices, General Specification For.  |
| MIL-PRF-31032 | - | Printed Circuit Board/Printed Wiring Board, General Specification For.                                     |
| MIL-PRF-38535 | - | Integrated Circuits (Microcircuits) Manufacturing, General Specification For.                              |
| MIL-PRF-39012 | - | Connectors, Coaxial, Radio Frequency; General Specification For.   |
| MIL-DTL-83723 | - | Connector, Electrical, Circular, Environmental Resistant Receptacles and Plugs, General Specification For. |

Comments, suggestions, or questions on this document should be addressed to: Commander, Defense Supply Center Columbus, ATTN: DSCC-VAT, P.O. Box 3990, Columbus, OH 43218-3990. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at [www.dodssp.daps.mil](http://www.dodssp.daps.mil).

## STANDARDS

### DEPARTMENT OF DEFENSE

- MIL-STD-202 - Test Method Standard - Electronic and Electrical Component Parts.
- MIL-STD-461 - Requirements for the Control of Electromagnetic Interference Emissions and Susceptibility.
- MIL-STD-889 - Dissimilar Metals.
- MIL-STD-1285 - Marking of Electrical and Electronic Parts.

(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 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 (see 6.3).

### INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

- ISO 10012-1 - Quality Assurance Requirements for Measuring Equipment. Part 1: Metrological Confirmation System for Measuring Equipment.

### NATIONAL CONFERENCE OF STANDARDS LABORATORIES (NCSL)

- NCSL Z540-1 - Calibration Laboratories and Measuring and Test Equipment, General Requirements for (DoD adopted).

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related associated specifications or specification sheets), 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. REQUIREMENTS

3.1 Specification sheets. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheet. In the event of any conflict between requirements of this specification and the specification sheet, the latter shall govern (see 6.3).

3.2 First article acceptance. Antenna switches furnished under this specification shall be products which pass first article acceptance testing (see 4.5 and 6.4).

3.3 Reliability. Reliability of switches furnished under this specification shall be established and maintained in accordance with suitable procedures and requirements.

3.4 Materials. The materials shall be as specified herein. However, when materials are other than specified herein, a material shall be used which will enable the switches to meet the requirements of this specification. Acceptance or approval of any constituent material shall not be construed as a guaranty of the acceptance of the finished product (see 4.3).

3.4.1 Finish. If the body of a switch is painted, it shall be painted with a semi-gloss or dull black enamel finish in accordance with type II of MIL-F-14072. Unless otherwise specified (see 6.3), all aluminum not intended to make electrical contact shall be treated in accordance with MIL-C-5541, class 3.

3.4.2 Dissimilar metals. Unless suitably protected against electrolytic corrosion, dissimilar metals shall not be used in intimate contact with each other. Dissimilar metals are defined in MIL-STD-889.

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3.4.3 Fungus. Materials used in the construction of switches shall be fungus inert (see 6.5).

3.5 Design and construction.

3.5.1 Dimensions, mounting, and weight. Envelope dimensions, mounting, mounting dimensions, connector arrangement, and weight shall be as specified (see 3.1).

3.5.2 Micro-electronic circuits. Micro-electronic circuits shall be in accordance with MIL-PRF-38535, class B minimum. The design shall incorporate a minimum number of components.

3.5.3 Semiconductors. Semiconductors shall be in accordance with MIL-PRF-19500, TX or TXV level.

3.5.4 Printed circuit boards. Printed circuit boards shall be in accordance with MIL-PRF-31032.

3.5.5 Connectors.

3.5.5.1 Radio frequency (RF) connectors. Connectors for a specific switch shall be as required (see 3.1). Material, design, and construction of the types listed below shall conform to the specifications as follows:

| <u>Type of RF connector</u> | <u>Specification</u> |
|-----------------------------|----------------------|
| N                           | MIL-PRF-39012        |
| TNC                         | MIL-PRF-39012        |
| BNC                         | MIL-PRF-39012        |
| SMA                         | MIL-PRF-39012        |
| SMC                         | MIL-PRF-39012        |
| SC                          | MIL-PRF-39012        |
| C                           | MIL-PRF-39012        |
| HN                          | MIL-DTL-3643         |

3.5.5.2 Power connectors. Connectors for a specific switch shall be as required (see 3.1). Materials, design, and construction shall conform to MIL-DTL-83723.

3.5.6 Configuration. Switches shall be furnished with the number of positions specified (see 3.1).

3.5.7 Sequence. Unless otherwise specified (see 3.1), switches shall have a break-before-make or make-before-break sequence of operation.

3.5.8 Nominal impedance. Nominal impedance shall be as specified (see 3.1).

3.5.9 Maintainability. Unless otherwise specified (see 3.1), switches furnished under this specification shall be the nonrepairable types. Mounting provisions shall insure that a minimal amount of time and effort is required for removal and replacement, using standard tools only.

3.5.10 Housings. Switch housings shall be as identified below and as specified (see 3.1).

- a. Enclosed (to exclude humidity): Type E.
- b. Hermetically sealed: Type H.
- c. Immersion-proof: Type I.

3.5.11 Frequency range. Switches shall be designed to operate throughout the specified frequency range (see 3.1).

3.5.12 Electromagnetic interference. Electromagnetic interference requirements for switches shall be in accordance with MIL-STD-461.

3.6 Performance.

3.6.1 Switching rate. When switches are tested as specified in 4.7.2, the switching rate shall not exceed the value specified (see 3.1).

3.6.2 Primary input power. When switches are tested as specified in 4.7.2, the primary input power shall not exceed the value specified (see 3.1).

3.6.3 Transition (overlap) time. When switches are tested as specified in 4.7.3, the transition time shall not exceed the value specified (see 3.1). The transition time is the period when the outputs are considered in parallel and the isolation is minimum.

3.6.4 Voltage standing wave ratio (VSWR). When switches are tested as specified in 4.7.4, the VSWR shall not exceed the value(s) specified (see 3.1).

3.6.5 Isolation. When switches are tested as specified in 4.7.5, the isolation between outputs shall be not less than the value specified (see 3.1).

3.6.6 Insertion loss. When switches are tested as specified in 4.7.6, the insertion loss shall not exceed the value specified (see 3.1).

3.6.7 RF power handling capability. When switches are tested as specified in 4.7.7, with rated peak power, and rated average power (when specified, see 3.1) passing through the switch, no evidence of breakdown shall be evident. Following each test, the VSWR value (see 3.1) shall be no greater than specified (see 3.1). Unless otherwise specified (see 3.1), switches shall be required to switch under power.

3.6.8 Temperature shock. When switches are tested as specified in 4.7.8, the VSWR, isolation, insertion loss, primary input power, switching rate, and transition time shall be as specified (see 3.1).

3.6.9 Vibration. When switches are tested as specified in 4.7.9, the VSWR, isolation, insertion loss, primary input power, switching rate, and transition time shall be as specified (see 3.1).

3.6.10 Humidity (applicable to type E only). When switches are tested as specified in 4.7.10, the VSWR, isolation, insertion loss, primary input power, switching rate, and transition time shall be as specified (see 3.1).

3.6.11 Hermetic seal (applicable to type H only). When switches are tested as specified in 4.7.11, the leakage rate shall not exceed the applicable value specified below. The volume shall be computed using the external dimensions of the switch housing, disregarding any mounting (screw, stud, etc.).

| <u>Sealed volume of case</u> | <u>Maximum allowable leakage</u> |
|------------------------------|----------------------------------|
| Greater than 2 cubic inches  | $1 \times 10^{-6}$ atm cc/sec    |
| 2 cubic inches or less       | $1 \times 10^{-8}$ atm cc/sec    |

3.6.12 Immersion (applicable to type I only). When switches are tested as specified in 4.7.12, the VSWR, isolation, insertion loss, primary input power, switching rate, and transition time shall be as specified (see 3.1).

3.6.13 Salt fog. When switches are tested as specified in 4.7.13, the VSWR, isolation, insertion loss, primary input power, switching rate, and transition time shall be as specified (see 3.1).

3.6.14 Shock. When switches are tested as specified in 4.7.14, the VSWR, isolation, insertion loss, primary input power, switching rate, and transition time shall be as specified (see 3.1).

3.6.15 Temperature-altitude. When switches are tested as specified in 4.7.15, the VSWR, isolation, insertion loss, primary input power, switching rate, and transition time shall be as specified (see 3.1).

3.6.16 Reliability. Unless otherwise specified (see 3.1), switches shall provide a minimum acceptable mean-time-between failure (MTBF) of 10,000 hours.

3.7 Marking (see 3.1). Switches shall be marked with the manufacturer's code identification and the military PIN (see 3.1 and 6.2). The date of manufacture of the item shall be marked on the part. The date code shall be as specified in MIL-STD-1285.

- a. Switches shall be marked with the type of supply, the operating voltage, and the frequency.
- b. Input and output connections shall be identified in a logical manner.

The marking shall remain legible after completing all environmental tests.

3.8 Workmanship. Switches shall be processed in such a manner as to be uniform in quality and shall be free from corrosion and other defects that will affect life, serviceability, or appearance.

4. VERIFICATION

4.1 Test equipment and inspection facilities. Test and measuring equipment and inspection facilities of sufficient accuracy, quality, and quantity to permit performance of the required inspection shall be established and maintained by the supplier. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment shall be in accordance with NCSL Z540-1 and ISO 10012-1.

4.2 Classification of inspections. The inspections specified herein are classified as follows:

- a. Materials inspection (see 4.3).
- b. First article acceptance inspection (see 4.5).
- c. Conformance inspection (see 4.6).

4.3 Materials inspection. Materials inspection shall consist of certification supported by verifying data that the materials listed in table I, used in fabricating the switches, are in accordance with the applicable referenced specifications or requirements prior to such fabrication.

TABLE I. Materials inspection.

| Material                        | Requirement paragraph | Applicable documents                          |
|---------------------------------|-----------------------|---|
| Finishes -----                  | 3.4.1                 | MIL-C-5541, MIL-F-14072                       |
| Dissimilar metals-----          | 3.4.2                 | MIL-STD-889                                   |
| Fungus -----                    | 3.4.3                 | (see 6.5)                                     |
| Micro-electronic circuits ----- | 3.5.2                 | MIL-PRF-38535                                 |
| Semiconductors -----            | 3.5.3                 | MIL-PRF-19500                                 |
| Printed circuit boards -----    | 3.5.4                 | MIL-PRF-31032                                 |
| Connectors -----                | 3.5.5                 | MIL-PRF-39012, MIL-DTL-3643,<br>MIL-DTL-83723 |

4.4 Inspection conditions. Unless otherwise specified herein, all inspections shall be performed in accordance with the test conditions specified in the "GENERAL REQUIREMENTS" of MIL-STD-202.

4.5 First article acceptance inspection. First article acceptance inspection shall be performed at a laboratory acceptable to the Government (see 6.4) on sample units produced with equipment and procedures normally used in production.

4.5.1 Sample size. Four switches shall be subjected to first article inspection. Each switch with a different basic design shall be first article accepted separately.

4.5.2 Inspection routine. The sample shall be subjected to the inspections specified in table II, in the order shown. All sample units shall be subjected to the inspections of group I. The sample shall then be divided into two groups of two units each. The sample units shall then be subjected only to the inspections indicated for the particular group.

TABLE II. First article inspection.

| Examination or test                                 | Requirement paragraph | Test paragraph |
|---|-----------------------|----------------|
| <u>Group I (all samples)</u>                        |                       |                |
| Visual and mechanical examination - - - - -         | 3.4, 3.5.1, and 3.8   | 4.7.1          |
| Marking - - - - -                                   | 3.7                   | 4.7.1          |
| Switching rate - - - - -                            | 3.6.1                 | 4.7.2          |
| Primary input power - - - - -                       | 3.6.2                 | 4.7.2          |
| Transition time - - - - -                           | 3.6.3                 | 4.7.3          |
| Voltage standing wave ratio- - - - -                | 3.6.4                 | 4.7.4          |
| Isolation - - - - -                                 | 3.6.5                 | 4.7.5          |
| Insertion loss - - - - -                            | 3.6.6                 | 4.7.6          |
| RF power handling capability - - - - -              | 3.6.7                 | 4.7.7          |
| Temperature shock- - - - -                          | 3.6.8                 | 4.7.8          |
| Vibration - - - - -                                 | 3.6.9                 | 4.7.9          |
| <u>Group II (2 samples)</u>                         |                       |                |
| Salt fog - - - - -                                  | 3.6.13                | 4.7.13         |
| Shock - - - - -                                     | 3.6.14                | 4.7.14         |
| Temperature-altitude- - - - -                       | 3.6.15                | 4.7.15         |
| <u>Group III (2 samples)</u>                        |                       |                |
| Humidity (applicable to type E only) - - - - -      | 3.6.10                | 4.7.10         |
| Hermetic seal (applicable to type H only) - - - - - | 3.6.11                | 4.7.11         |
| Immersion (applicable to type I only) - - - - -     | 3.6.12                | 4.7.12         |

4.5.3 Failures. No failures shall be allowed for first article inspection; a failure shall be anything that does not meet the requirements of the specification.

4.5.4 Reliability inspections. Seven switches shall be tested for reliability. Two of the seven switches shall continue through a longevity test. Longevity test shall not be a criteria for first article acceptance of the switch. Acceptance shall be judged by the responsible activity (see 6.4).

4.6 Conformance inspection.

4.6.1 Inspection of product for delivery. Inspection of product for delivery shall consist of group A.

4.6.1.1 Inspection lot. An inspection lot shall consist of all switches of the same PIN, produced under essentially the same conditions, and offered for inspection at one time.

4.6.1.2 Group A inspection. Group A inspection shall consist of the examination and tests specified in table III, in the order shown.

TABLE III. Group A inspection.

| Examination or test                         | Requirement paragraph | Test paragraph |
|---|-----------------------|----------------|
| <u>Subgroup I</u>                           |                       |                |
| Visual and mechanical examination - - - - - | 3.4, 3.5.1, and 3.8   | 4.7.1          |
| Marking - - - - -                           | 3.7                   | 4.7.1          |
| Switching rate- - - - -                     | 3.6.1                 | 4.7.2          |
| Primary input power - - - - -               | 3.6.2                 | 4.7.2          |
| Transition time - - - - -                   | 3.6.3                 | 4.7.3          |
| Voltage standing wave ratio- - - - -        | 3.6.4                 | 4.7.4          |
| Isolation - - - - -                         | 3.6.5                 | 4.7.5          |
| Insertion loss- - - - -                     | 3.6.6                 | 4.7.6          |
| <u>Subgroup II</u>                          |                       |                |
| Acceptance reliability- - - - -             | 3.6.16                | ---            |

4.6.1.2.1 Group A sampling plan. For subgroup II, the monthly sample size shall be tested. Statistical sampling and inspection shall be performed on an inspection lot basis with a random sample of switches selected in accordance with table IV. Acceptance shall be based upon the zero defect sampling plan. No failures shall be permitted.

TABLE IV. Group A sampling plan.

| Lot size          | Sample size |
|-------------------|-------------|
| 1 - 13            | 100 percent |
| 14 - 150          | 13          |
| 151 - 280         | 20          |
| 281 - 500         | 29          |
| 501 - 1,200       | 34          |
| 1,201 - 3,200     | 42          |
| 3,201 - 10,000    | 50          |
| 10,001 - 35,000   | 60          |
| 35,001 - 150,000  | 74          |
| 150,001 - 500,000 | 90          |
| 500,001 and over  | 102         |

4.6.1.3 Rejected lots. If an inspection lot is rejected, the supplier may rework it to correct the defects, or screen out the defective units, and resubmit for reinspection. Resubmitted lots shall be inspected using tightened inspection. Such lots shall be separated from new lots, and shall be clearly identified as reinspected lots.

4.6.2 Conformance verification inspection. Conformance verification inspection shall consist of group B. Delivery of products which have passed group A shall not be delayed pending the results of these conformance verification inspections.

4.6.2.1 Group B inspection. Group B inspection shall consist of the tests specified in table V in the order shown. Group B inspection shall be made on sample units which have passed group A inspection.

TABLE V. Group B inspection.

| Test  | Requirement paragraph | Test paragraph | Number of sample units to be inspected |
|---|-----------------------|----------------|--|
| RF power handling capability -----              | 3.6.7                 | 4.7.7          | }<br> <br> <br> <br>}<br> <br> <br>}   |
| Temperature shock -----                         | 3.6.8                 | 4.7.8          |  |
| Vibration -----                                 | 3.6.9                 | 4.7.9          |  |
| Salt fog -----                                  | 3.6.13                | 4.7.13         |  |
| Shock-----                                      | 3.6.14                | 4.7.14         |  |
| Temperature-altitude-----                       | 3.6.15                | 4.7.15         |  |
| Humidity (applicable to type E only) -----      | 3.6.10                | 4.7.10         |  |
| Hermetic seal (applicable to type H only) ----- | 3.6.11                | 4.7.11         |  |
| Immersion (applicable to type I only)- -----    | 3.6.12                | 4.7.12         |  |

4.6.2.1.1 Sampling plan. Sample units shall be selected every 6 months. Upon passing this inspection, the supplier may select sample units every 12 months. If the second level of sampling is passed two successive times, the supplier may select sample units every 24 months. In the event of a failure, sampling may revert to the 6-month interval.

4.6.2.1.2 Failures. If failures occur, the sample shall be considered to have failed.

4.6.2.1.3 Disposition of sample units. Sample units which have been subjected to group B inspection shall not be delivered on the contract or purchase order.

#### 4.7 Methods of examination and test.

4.7.1 Visual and mechanical examination (see 3.4, 3.5.1, 3.7, and 3.8). Switches shall be examined to verify that the materials, size, mounting, weight, design, construction, finish, marking, and workmanship are in accordance with the applicable requirements.

4.7.2 Switching rate and primary input power (see 3.6.1 and 3.6.2). The switching rate and primary input power of the switch shall be determined at the center of the specified (see 3.1) RF frequency range and the primary input voltage and frequency (when applicable) at the specified (see 3.1) nominal, lowest, and highest value.

4.7.3 Transition time (see 3.6.3). The transition time shall be measured by determining the length of time that the isolation between outputs is at the lowest value. Test shall be made with the switch energized with nominal input power and an RF signal into one RF output and a pad, detector, and oscilloscope connected to another RF output. The RF signal shall be at the center frequency of the specified frequency range.

4.7.4 Voltage standing wave ratio (VSWR) (see 3.6.4). The VSWR shall be determined for each switch position and when specified (see 3.1), during the period when the outputs are in parallel. Unless otherwise specified (see 3.1), swept frequency technique shall be used to determine the VSWR over the specified (see 3.1) frequency range.

4.7.5 Isolation (see 3.6.5). With the switch energized with nominal input power, the isolation between outputs shall be determined using the swept frequency technique over the specified frequency range.

4.7.6 Insertion loss (see 3.6.6). The insertion loss shall be measured with the switch stopped on each RF output. Swept frequency technique shall be used to determine the insertion loss over the specified frequency range (see 3.1).

4.7.7 RF power handling capability (see 3.6.7). With the switch energized with nominal input power, the switch shall be subjected to the specified (see 3.1) RF power and frequency for the specified period of time. During the test the switch shall be terminated with the specified load. After the test, the VSWR shall be measured as specified in 4.7.4.

4.7.8 Temperature shock (see 3.6.8). Switches shall be placed within a test chamber wherein the highest specified temperature (see 3.1) is maintained. Unless otherwise specified, switches shall be exposed to this temperature for a period of 4 hours; at the conclusion of this time and within 5 minutes, unless otherwise specified, the switches will be transferred to a chamber having the lowest specified temperature (see 3.1) for a period of 4 hours. This constitutes one cycle of temperature shock. Switches shall be nonoperating for the entire exposure. Three complete cycles shall be performed on a continuing basis. However, either the high or the low temperature soak periods can be extended to an overnight period to prevent interruption of the transfer sequence. After the test, the switches shall be subjected to the individual tests of group I in table III.

4.7.9 Vibration (see 3.6.9). Switches shall be tested in accordance with MIL-STD-202, method 204, test condition C. After the test, switching rate, primary input power, transition time, VSWR, isolation, and insertion loss shall be measured as specified in 4.7.2 through 4.7.6, respectively.

4.7.10 Humidity (applicable to type E only) (see 3.6.10). Switches shall be tested in accordance with MIL-STD-202, method 103, test condition A. After the test, switching rate, primary input power, transition time, VSWR, isolation, and insertion loss shall be measured as specified in 4.7.2 through 4.7.6, respectively.

4.7.11 Hermetic seal (applicable to type H only) (see 3.6.11). Hermetically-sealed switches shall be tested in accordance with method 112 of MIL-STD-202. The following details shall apply:

- a. Test condition letter: C (protective connector caps shall be used during test).
- b. Procedure III.
- c. Degree of leakage rate sensitivity: See 3.6.11.

4.7.12 Immersion (applicable to type I only) (see 3.6.12). Immersion-proof switches shall be tested in accordance with method 104 of MIL-STD-202. The following details shall apply:

- a. Test condition letter: A (protective connector caps shall be used during test).
- b. During test cycle and while submerged, the sample shall be subjected to a low barometric pressure of 3.44 in Hg (50,000 feet altitude).
- c. Measurements: No leakage as evidenced by a continuous stream of bubbles. Bubbles which are the result of entrapped air on the exterior surface of the switch shall not be considered as an indication of leakage.

After the test, switching rate, primary input power, transition time, VSWR, isolation, and insertion loss shall be measured as specified in 4.7.2 through 4.7.6, respectively.

4.7.13 Salt fog (see 3.6.13). Switches shall be tested in accordance with MIL-STD-202, method 101, test condition B. After the test, switching rate, primary input power, transition time, VSWR, isolation, and insertion loss shall be measured as specified in 4.7.2 through 4.7.6, respectively.

4.7.14 Shock (see 3.6.14). Switches shall be tested in accordance with MIL-STD-202, method 213, figure 213-2, time duration 11 ms, 20 g's. After the test, switching rate, primary input power, transition time, VSWR, isolation, and insertion loss shall be measured as specified in 4.7.2 through 4.7.6, respectively.

4.7.15 Temperature-altitude (see 3.6.15). Switches shall be tested individually for environmental effects of altitude and temperature in accordance with (1) MIL-STD-202, method 105, test condition D and (2) MIL-STD-202, method 107, test condition B, with environmental test chamber exposure times of 2 hours for step 1 and of 4 hours for step 3. After each test, switching rate, primary input power, transition time, VSWR, isolation, and insertion loss shall be measured as specified in 4.7.2 through 4.7.6, respectively.

5. PACKAGING

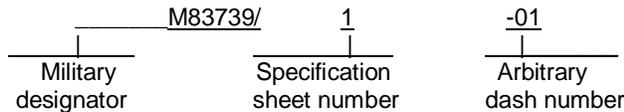
5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.3). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature which may be helpful, but is not mandatory.)

6.1 Intended use. Switches covered by this document are designed for use with RF coaxial transmission line systems.

6.2 Part or Identifying Number (PIN). The PIN must be as follows:



6.3 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification.
- b. Title, number, and date of applicable specification sheet, and the complete PIN.
- c. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2.1).
- d. Specify when aluminum should not be anodized (see 3.4.1).
- e. Packaging requirements (see 5.1).
- f. Special marking, if required.

6.4 First article acceptance. The activity responsible for first article acceptance is the Defense Supply Center Columbus, Code VQE, P.O. Box 3990, Columbus, OH 43218-3990, and information pertaining to first article testing may be obtained from that activity.

6.5 Fungus-inert materials (see 3.4.3 and Table I). MIL-HDBK-454, Guideline 4 provides guidance on fungus-inert materials.

6.6 Subject term (key word) listing.

|                              |                |                        |
|------------------------------|----------------|------------------------|
| Coaxial transmission line    | Finish         | Printed circuit boards |
| Connectors                   | Housings       | Semiconductor devices  |
| Dissimilar metals            | Insertion loss | Transition time        |
| Electromagnetic interference | Isolation      | VSWR                   |

6.7 Changes from previous issue. The margins of this specification are marked with vertical lines to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

MIL-DTL-83739C

Custodians:  
Army - CR  
Navy - EC  
Air Force - 11  
DLA - CC

Preparing activity:  
DLA - CC  
  
(Project 5985-1323)

NOTE: The activities listed above were interested in this document as of the date of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at [www.dodssp.daps.mil](http://www.dodssp.daps.mil).