

# **DESTRUCTIVE PHYSICAL ANALYSIS TESTING SPECIFICATION FOR THE INTERNATIONAL SPACE STATION PROGRAM**

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## **INTERNATIONAL SPACE STATION PROGRAM**

**SSQ 25000 Revision C  
November 22, 1999**

**National Aeronautics and Space Administration  
International Space Station Program  
Johnson Space Center, Houston Texas  
Contract No. NAS15-10000**



**REVISION AND HISTORY PAGE**

<b>REV LTR</b>		<b>PUB DATE</b>
-	<b>BASELINE ISSUE</b>	<b>8/27/93</b>
A	<b>REASON: Update to ISSA Program requirements and correct minor errors. Include CR 25000-001</b>	<b>1/20/95</b>
B	<b>Official PCB Release Version (include CR 25000-002 and 25000-006)</b>	<b>03-26-99</b>
C	<b>Revision C Authorized By SSCN 002439</b>	<b>09-13-01</b>

ERU: /s/ M. Hehn 09-13-01

**PREFACE**

SSQ 25000, Space Station Program Destructive Physical Analysis testing Specification is a procedure which defines the testing to be performed on electrical, electronic, and electromechanical parts to be utilized on the Space Station program.

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Program Manager (or delegated authority)  
Space Station Program

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Date

SSQ 25000 Revision C

November 22, 1999

**SPACE STATION PROGRAM OFFICE  
DESTRUCTIVE PHYSICAL ANALYSIS TESTING SPECIFICATION  
NOVEMBER 22, 1999**

**CONCURRENCE**

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**SPACE STATION PROGRAM  
DESTRUCTIVE PHYSICAL ANALYSIS TESTING SPECIFICATION**

**LIST OF CHANGES**

**NOVEMBER 22, 1999**

**All changes to this document are shown below:**

<b>SSCBD</b>	<b>ENTRY DATE</b>	<b>CHANGE</b>	<b>PARAGRAPH</b>
<b>TBD</b>	<b>1/20/95</b>	<b>REVISION A</b>	<b>All</b>
<b>TBD</b>	<b>06/11/96</b>	<b>REVISION B</b>	<b>All</b>
<b>SSCN 002439</b>	<b>8/30/99</b>	<b>REVISION C</b>	<b>Appendix D-1 and E-1</b>

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## **1.0 SCOPE**

This drawing describes the specific minimum requirements for Destructive Physical Analysis testing to be performed on electrical, electronic, and electromechanical parts to be utilized on the International Space Station Program. This drawing draws on technical criteria set forth in Mil-Std-1580 Rev. A. Minor enhancements and deletions have been made to tailor this document to program requirements. This document has been created to provide a means by which ISSA DPA Testing can be standardized across the program. The specific requirements listed are considered minimum and may be augmented as deemed necessary.

## **2.0 GOVERNMENT DOCUMENTS**

Reference documents shall be those noted within MIL-STD-1580 Revision A in addition to the following:

SSP 30312

MIL-STD-45662

### 3.0 GENERAL REQUIREMENTS

#### 3.1 Sample size

When a DPA is conducted to verify lot conformance of a particular production lot of EEE parts, the minimum sample size shall be 3 samples or 1% of the lot size, whichever is larger to a maximum of 5 parts. For devices which cost in excess of \$1,500 a sample size of 2 may be used. One correlation sample will be maintained for each DPA test lot. The correlation sample will not be drawn from the DPA sample quantity defined above, but rather, will be provided in addition to the DPA sample size stated. Samples to be subjected to Residual Gas Analysis (RGA) testing shall also be provided in addition to the DPA sample lot, and may be used for other DPA tests if in suitable condition. The Tier 1 contractor may consider on a case by case basis reducing the sample size where surveillance, vendor history, and good engineering judgment is appropriate, provided they meet the intent of DPA planning sheets inspection quantities herein.

#### 3.2 Configuration control

Maintenance of baseline configuration control of devices utilized on this program will be performed at the contractor.

#### 3.3 Utilization of electrical rejects

Electrical reject devices from a production lot may be used as DPA samples provided that the devices were only rejected due to out of tolerance parameters. These devices may consist of parts rejected during previous screening inspections. These devices should only be utilized when part availability is low or cost is high, as applicable.

#### 3.4 Photography

The photographic requirements of MIL-STD-1580 will be sufficient. At external visual inspection, care should be taken to ensure that all part markings are recorded prior to disassembly. All serious anomalous conditions will be documented in enough detail to allow proper identification of the condition(s). Color film with a minimum size of 2 and 3/4 by 3 and 3/4 inches will be required for photo documentation. An 8 by 10 inch color photograph of the die or the hybrid substrate will be required for microcircuits and hybrids as specified within.

#### 3.5 Laboratory suitability

DPA testing laboratories shall be ISSA Parts Control Board (PCB) Analysis and Integration Team (AIT) approved prior to performance of testing.

#### 3.6 DPA report

At the completion of the DPA analysis, a complete report detailing the findings shall be generated. The report will meet, as a minimum, the requirements of MIL-STD-1580 Revision A paragraph 4.2.2 except for X-rays and N-rays.

3.7 DPA residues

All residues (plus the control sample) shall be packaged, marked, and accompany the original report to the contractor for final approval and retention.

#### 4.0 DPA TESTING REQUIREMENTS

The specific DPA testing criteria and process flows are stated in the following attached appendices:

##### LIST Of APPENDICES

Appendix	Part Types
A-1	Capacitor, fixed ceramic and stacked modules
A-2	Capacitor, ceramic chip
A-3	Capacitor, mica
A-4	Capacitor, solid tantalum
A-5	Capacitor, fixed tantalum foil
A-6	Capacitor, paper or plastic film
A-7	Capacitor metalized film
A-8	Capacitor, wet tantalum
A-9	Capacitor, fixed glass
A-10	Capacitor, variable piston
B-1	Connectors and contacts
C-1	Quartz crystals
D-1	Diode, glass
E-1	EMI feed-through filters
F-1	Magnetic devices, inductors, and transformers
F-2	Magnetic devices, RF coils
G-1	Microcircuits
G-2	Hybrid microcircuit
H-1	Relays

**LIST Of APPENDICES (continued)**

Appendix	Part Types
I-1	Resistor, metalized fixed film
I-2	Resistor network
I-3	Resistor network
I-4	Resistor, wirewound accurate
I-5	Resistor, fixed wirewound
I-6	Resistor, fixed chip
J-1	Switch, snap action
J-2	Thermal switch
K-1	Thermistor, glass bodied, hermetic
K-2	Thermistor, disc and bead, encapsulated
L-1	Transistors and metal can diodes
M-1	Fuse, thick film

## DPA PLANNING SHEET

## APPENDIX A-1

## CAPACITOR, FIXED CERAMIC AND STACKED MODULES

DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):

## MIL-STD-1580 REV. A SEC 5.1

TASK DESCRIPTION AND SEQUENCE	DOCUMENT - METHOD AND CONDITION	QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO
EXTERNAL VISUAL INSPECTION	MIL-STD-1580 PARA. 5.1.1.1	ALL
EXTERNAL PHOTODOCUMENTATION	PARA. 4.5	ONE MINIMUM
DECAPSULATION	PARA. 5.1.1.3	50% ROUND DOWN
INTERNAL VISUAL INSPECTION <u>2/</u>	PARA. 5.1.1.4	50% ROUND DOWN
INTERNAL PHOTODOCUMENTATION	PARA. 4.5	ONE MINIMUM
ENCAPSULATE	PARA. 5.1.1.5 (EIA-RS 469)	ALL
CROSS SECTION <u>1/</u> , <u>2/</u>	PARA. 5.1.1.6	ALL
INTERNAL VISUAL INSPECTION	PARA. 5.1.1.6 (EIA-RS 469)	ALL
INTERNAL PHOTODOCUMENTATION	PARA. 4.5	ONE MINIMUM
HIGH TEMPERATURE SOLDER VERIFICATION	PARA. 5.1.1.4	ONE DEVICE
ENGINEERING REVIEW		

**NOTES:** 1/ Cross-section the decapsulated samples through the side of the capacitor bodies to show plate registry. Cross-section the encapsulated devices in a plane perpendicular to the lead axis to show the quality of lead attachment.

2/ For stacked ceramic capacitor modules verify suitability of the lead frame solder / brazing. check for foreign material between capacitor stacks.

**DPA PLANNING SHEET**  
**APPENDIX A-2**  
**CAPACITOR, CERAMIC CHIP**

**DPA TESTING PERFORMED IN ACCORDANCE**  
**WITH THE FOLLOWING DOCUMENT(S):**  
**MIL-STD-1580 REV. A SEC 5.2**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>MIL-STD-1580 PARA. 5.2.1.1</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>DECAPSULATION</b>	<b>PARA. 5.2.1.3</b>	<b>ALL</b>
<b>CROSS SECTION</b>	<b>EIA-RS 469</b>	<b>ALL</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>EIA-RS 469 PARA, 4.2 THRU 5.10</b>	<b>ALL</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENGINEERING REVIEW</b>		

**NOTES:**

**DPA PLANNING SHEET****APPENDIX A-3****CAPACITOR, MICA**

**DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):**

**MIL-STD-1580 REV. A SEC 5.3**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>MIL-STD-1580 PARA. 5.3.1.1</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>DECAPSULATION</b>	<b>PARA. 5.3.1.3</b>	<b>50% ROUND UP</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 5.3.1.4</b>	<b>50% ROUND UP</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENCAPSULATE</b>	<b>PARA. 5.3.1.5</b>	<b>REMAINING SAMPLES</b>
<b>CROSS SECTION</b>	<b>PARA. 5.3.1.5</b>	<b>REMAINING SAMPLES</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 5.3.3</b>	<b>REMAINING SAMPLES</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENGINEERING REVIEW</b>		

**NOTES:**

**DPA PLANNING SHEET****APPENDIX A-4****CAPACITOR, SOLID TANTALUM**

**DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):**

**MIL-STD-1580 REV. A SEC 5.4**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>MIL-STD-1580 PARA. 5.4.1.1</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>CROSS SECTION</b>	<b>PARA. 5.4.1.3</b>	<b>50% ROUND UP</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 5.4.1.3 AND 5.4.3</b>	<b>50% ROUND UP</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>DISASSEMBLY</b>	<b>PARA. 5.4.1.4</b>	<b>REMAINING DEVICES</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 5.4.3</b>	<b>REMAINING DEVICES</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENGINEERING REVIEW</b>		

**NOTES:**

**DPA PLANNING SHEET****APPENDIX A-5****CAPACITOR, FIXED TANTALUM FOIL****DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):****MIL-STD-1580 REV. A SEC 5.5**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>PARA. 5.4.1.1</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>DISASSEMBLY</b>	<b>PARA. 5.5.1.3</b>	<b>ALL</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 5.5.3</b>	<b>ALL</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.6</b>	<b>ONE MINIMUM</b>
<b>ENGINEERING REVIEW</b>		

**NOTES:**

**DPA PLANNING SHEET****APPENDIX A-6****CAPACITOR, PAPER OR PLASTIC FILM**

**DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):**

**MIL-STD-1580 REV. A SEC 5.6**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>PARA. 5.6.1.1</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>DISASSEMBLY</b>	<b>PARA. 5.6.1.3</b>	<b>ALL</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 5.6.1.4 AND 5.6.3 <u>1/</u></b>	<b>ALL</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.6</b>	<b>ONE MINIMUM</b>
<b>ENGINEERING REVIEW</b>		

**NOTES: 1/ Pull test optional, used only to ensure there isn't a cold solder joint.**

**DPA PLANNING SHEET****APPENDIX A-7****CAPACITOR, METALLIZED FILM**

**DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):**

**MIL-STD-1580 REV. A SEC 5.7**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>MIL-STD-1580 PARA. 5.7.1.1</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>DISASSEMBLY</b>	<b>PARA. 5.7.1.3</b>	<b>ALL</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 5.7.1.4 AND 5.7.3</b>	<b>ALL</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENCAPSULATE</b>	<b>PARA. 5.7.1.3</b>	<b>ALL HEADERS</b>
<b>CROSS SECTION</b>	<b>PARA. 5.7.1.3</b>	<b>ALL HEADERS</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 5.7.1.3</b>	<b>ALL HEADERS</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENGINEERING REVIEW</b>		

**NOTES:**

**DPA PLANNING SHEET****APPENDIX A-8****CAPACITOR, WET TANTALUM**

**DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):**

**MIL-STD-1580 REV. A SEC 5.8**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>MIL-STD-1580 PARA. 5.8.1.1</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>HERMETICITY TESTING</b>	<b>PARA. 5.8.1.2</b>	<b>ALL</b>
<b>DISASSEMBLY</b>	<b>PARA. 5.8.1.3</b>	<b>ALL</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 5.8.3 AND 5.8.3.1</b>	<b>ALL</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENGINEERING REVIEW</b>		

**NOTES:**

**DPA PLANNING SHEET****APPENDIX A-9****CAPACITOR, FIXED GLASS**

**DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):**

**MIL-STD-1580 REV. A SEC 5.9**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>MIL-STD-1580 PARA. 5.9.1.1</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENCAPSULATION</b>	<b>PARA. 5.9.1.3</b>	<b>ALL</b>
<b>CROSS SECTION</b>	<b>PARA. 5.9.1.3</b>	<b>ALL</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 5.9.2 AND 5.9.3</b>	<b>ALL</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENGINEERING REVIEW</b>		

**NOTES:**

**DPA PLANNING SHEET****APPENDIX A-10****CAPACITOR, VARIABLE PISTON**

**DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):**

**MIL-STD-1580 REV. A SEC 5.10**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>PARA. 5.10.1.1</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>PISTON ROTATION TEST</b>	<b>PARA. 5.10.1.1</b>	<b>ALL</b>
<b>DISASSEMBLY</b>	<b>PARA. 5.10.1.3 AND 5.10.1.4 A, B, OR C</b>	<b>ALL BUT ONE</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 5.10.3 AND 5.10.3.1</b>	<b>ALL BUT ONE</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENCAPSULATE</b>	<b>PARA. 5.10.1.5</b>	<b>ONE</b>
<b>CROSS SECTION</b>	<b>PARA. 5.10.1.5</b>	<b>ONE</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 5.10.3 AND 5.10.3.1</b>	<b>ONE</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE</b>
<b>ENGINEERING REVIEW</b>		

NOTES:

**DPA PLANNING SHEET****APPENDIX B-1****CONNECTORS/CONTACTS****DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):****MIL-STD-1580 REV. A SEC 6.1**

<b>EXTERNAL VISUAL INSPECTION</b>	<b>PARA. 6.1.1.1</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>PLATING ADHESION</b>	<b>PARA. 6.1.1.4 d</b>	<b>ONE PIN ON ALL SAMPLES</b>
<b>ENCAPSULATE <u>1/</u></b>	<b>PARA. 6.2.1.2.1</b>	<b>ALL</b>
<b>CROSS SECTION <u>1/</u></b>	<b>PARA. 6.2.1.2.1</b>	<b>ALL</b>
<b>PLATING THICKNESS VERIFICATION <u>1/</u></b>	<b>PARA. 6.2.1.2.1</b>	<b>ALL</b>
<b>INTERNAL VISUAL</b>	<b>PARA. 6.2.1.2.1 AND 6.3.1.2</b>	<b>ALL</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5 &amp; ONE 1000X PHOTO OF EACH PLATING MEASURED</b>	<b>ALL</b>
<b>ENGINEERING REVIEW</b>		

**NOTES: 1/ Determine the plating thickness on case and contacts as applicable, and verify them in accordance with the appropriate procurement specification.**

**DPA PLANNING SHEET****APPENDIX C-1****QUARTZ CRYSTALS****DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):****MIL-STD-1580 REV. A SEC 7**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>PARA. 7.1.1.1</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>DELID</b>	<b>PARA. 7.1.1.3</b>	<b>ALL</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 7.1.1.4 AND 7.1.3</b>	<b>ALL</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENGINEERING REVIEW</b>		

**NOTES:**

**DPA PLANNING SHEET****APPENDIX D-1****DIODE, GLASS****DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):****MIL-STD-1580 REV. A SEC 8.1**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>PARA. 8.1.1.2</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>PAINT REMOVAL</b>	<b>STANDARD LAB PROCEDURE</b>	<b>ALL</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 8.1.1.6</b>	<b>ALL</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>HERMETICITY (ONLY IF LOW GLASS SEAL NOTED AT INTERNAL VISUAL)</b>	<b>MIL-STD-750 METHOD 1071, CONDITION E (DYE PENETRANT)</b>	<b>AS NECESSARY</b>
<b>SCRIBE AND BREAK</b>	<b>PER MIL-STD-750, METHOD 2101, PARAGRAPH 5.2.</b>	<b>TWO MINIMUM</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 8.1.1.6</b>	<b>TWO MINIMUM</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>TWO MINIMUM</b>
<b>ENGINEERING REVIEW</b>		

**DPA PLANNING SHEET****APPENDIX E-1****EMI FEED THROUGH FILTERS**

**DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):**

**MIL-STD-1580 REV. A SEC 9**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>PARA. 9.1.1.1</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENCAPSULATION (PLANE 1) LONGITUDINAL</b>	<b>PARA. 9.1.1.3</b>	<b>50% ROUND UP</b>
<b>ENCAPSULATION (PLANE 2) TRANSVERSE</b>	<b>PARA. 9.1.1.3</b>	<b>REMAINING DEVICES</b>
<b>CROSS SECTION</b>	<b>PARA. 9.1.1.3</b>	<b>ALL</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 9.1.1.4 AND 9.1.3 <u>1</u>/</b>	<b>ALL</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENGINEERING REVIEW</b>		

**NOTES:**

**1/ 9.1.3, M: Egress of leads through the eyelet or tubulet not soldered for a minimum distance equal to the tubulet wire diameter**

## DPA PLANNING SHEET

## APPENDIX F-1

## MAGNETIC DEVICES, INDUCTORS, AND TRANSFORMERS

DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):

MIL-STD-1580 REV. A SEC 10.1

TASK DESCRIPTION AND SEQUENCE	DOCUMENT - METHOD AND CONDITION	QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO
EXTERNAL VISUAL INSPECTION	PARA. 10.1.1.1	ALL
EXTERNAL PHOTODOCUMENTATION	PARA. 4.5	ONE MINIMUM
RADIOGRAPHY	PARA. 10.1.1.3 (3 VIEWS)	ALL
DECAPSULATION STEP 1 STEP 2	PARA. 10.1.1.4	ALL
INTERNAL VISUAL INSPECTION <u>1/</u>	PARA. 10.1.3	ALL
INTERNAL PHOTODOCUMENTATION	PARA. 4.5	ONE MINIMUM
HIGH TEMPERATURE <u>2/</u> SOLDER VERIFICATION	PARA. 5.1.1.4	ONE
ENGINEERING REVIEW		

## NOTES:

- 1/ The internal visual inspection criteria of MIL-STD-1580 will be utilized in conjunction with and will be superseded by MIL-T-27 and MIL-STD-981 when applicable.
- 2/ Verify that high temperature solder was utilized on the last solder joint to the external lead. Use techniques stated in paragraph 5.1.1.4.

**DPA PLANNING SHEET****APPENDIX F-2****MAGNETIC DEVICES, RF COILS****DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):****MIL-STD-1580 REV. A SEC 10.2**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>PARA. 10.2.1.1</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>DECAPSULATION</b>	<b>PARA. 10.2.1.3</b>	<b>50% ROUND UP</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 10.2.1.4</b>	<b>50% ROUND UP</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENCAPSULATION</b>	<b>PARA. 10.2.1.5</b>	<b>REMAINING SAMPLES</b>
<b>CROSS SECTION</b>	<b>PARA. 10.2.1.5</b>	<b>REMAINING SAMPLES</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 10.2.3 AND 10.2.3.1</b>	<b>REMAINING SAMPLES</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENGINEERING REVIEW</b>		

## DPA PLANNING SHEET

## APPENDIX G-1

## MICROCIRCUIT

DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):

MIL-STD-1580 REV. A SEC 11/MIL-STD-883 METHOD 5009

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>MIL-STD-883 METHOD 2009</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>MIL-STD-1580 PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>RGA</b>	<b>MIL-STD-883 METHOD 1018</b>	<b>ONE DEVICE PROVIDED IN ADDITION TO THE DPA SAMPLES</b>
<b>DELID</b>	<b>MIL-STD-883 METHOD 5009 PARA. 3.6</b>	<b>ALL</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>MIL-STD-883 METHOD 2010 COND. A</b>	<b>ALL</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>1 8X10 INCH COLOR PHOTO OF DIE, 1 OVERALL PHOTO OF DIE CAVITY.</b>	<b>ONE MINIMUM</b>
<b>BOND PULL TESTING</b>	<b>MIL-STD-883 METHOD 2011</b>	<b>ALL</b>
<b>GLASSIVATION REMOVAL</b>	<b>STANDARD LABORATORY PROCEDURE</b>	<b>50% ROUND UP</b>
<b>SEM ANALYSIS <u>1</u></b>	<b>MIL-STD-883 METHOD 2018</b>	<b>50% ROUND UP</b>
<b>DIE SHEAR TESTING</b>	<b>MIL-STD-883 METHOD 2019</b>	<b>ALL</b>
<b>ENGINEERING REVIEW</b>		

**DPA PLANNING SHEET**

**APPENDIX G-1**

**DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):  
MIL-STD-1580 REV. A SEC 11/MIL-STD-883 METHOD 5009  
MICROCIRCUIT (continued)**

**NOTES:**

**1/ Photodocumentation required on one device only. Photographs will be representative of worst case conditions noted. Two photos are required per layer of metallization examined in addition to one general metallization photo. If anomalous conditions are noted additional documentation is required.**

**DPA PLANNING SHEET****APPENDIX G-2****HYBRID MICROCIRCUIT****DPA TESTING PERFORMED IN ACCORDANCE****WITH THE FOLLOWING DOCUMENT(S):****MIL-STD-1580 REV. A SEC 11/MIL-STD-883 METHOD 5009**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>MIL-STD-883 METHOD 2009</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>MIL-STD-1580 PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>RGAs</b>	<b>MIL-STD-883 METHOD 1018</b>	<b>ONE DEVICE (DEVICE TO BE USED IN REST OF ANALYSIS)</b>
<b>DELID</b>	<b>MIL-STD-883 METHOD 5009 PARA. 3.6</b>	<b>ALL</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>MIL-STD-883 METHOD 2017 COND. A</b>	<b>ALL</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>1 8X10 INCH COLOR PHOTO OF ENTIRE CAVITY OF DEVICE</b>	<b>ONE MINIMUM</b>
<b>BOND PULL TESTING</b>	<b>MIL-STD-883 METHOD 2011</b>	<b>ALL (ALL WIRES)</b>
<b>GLASSIVATION REMOVAL</b>	<b>STANDARD LABORATORY PROCEDURE</b>	<b>50% ROUND UP</b>
<b>SEM ANALYSIS <u>1/</u></b>	<b>MIL-STD-883 METHOD 2018</b>	<b>50% ROUND UP</b>
<b>DIE SHEAR TESTING</b>	<b>MIL-STD-883 METHOD 2019</b>	<b>ALL</b>

**DPA PLANNING SHEET****APPENDIX G-2 (continued)****HYBRID MICROCIRCUIT**

**DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):  
MIL-STD-1580 REV. A SEC 11/MIL-STD-883 METHOD 5009**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>PASSIVE ELEMENT SHEAR TESTING <u>2/</u></b>	<b>MIL-STD-883 METHOD 2019 &amp; NOTE <u>2/</u></b>	<b>ALL</b>
<b>ENGINEERING REVIEW</b>		

**NOTES:**

**1/ Photodocumentation required on one each different die type/topography with expanded metallization within one hybrid. Every die within each device shall be inspected for metallization coverage. Photographs will be representative of worst case conditions noted. Two photos are required per layer of metallization examined in addition to one general metallization photo. If anomalous conditions are noted, additional documentation is required.**

**2/ Passive element shear shall be performed in accordance with the attached test procedure and criteria.**

**APPENDIX G-2****PASSIVE ELEMENT SHEAR TESTING**

All passive elements within the hybrid cavity shall be shear tested as feasible in accordance with MIL-STD-883 Method 2019 except as noted below:

1. The acceptance criteria will be the 1.0 X force level of Method 2019 only. This is due to the fact that Method 2019 does not take into account polymeric or glass attachment materials for silicone or non silicon elements within hybrid devices. If the 1.0 X force level criteria are met then the results will be considered acceptable.
2. The shear force will be applied as stated in Method 2019 in a plane perpendicular to the longest axis of the passive element. The attachment area will be defined by measuring the actual possible area of attachment to a device as practical for its design. For example: a ceramic chip capacitor is typically attached at its end metallization areas. The attachment area would be obtained by measuring one of those end metal areas optically from an incident angle. This value would then be multiplied by two to obtain the attachment area prior to testing. Staking material beneath the capacitor body will not be measured as it is commonly used to ensure adequate mechanical support but is not typically required for attachment purposes. If any element has been intentionally attached by its total bottom surface area, the that area will be considered the attachment area for the proposes of this evaluation.
3. The elements will be sheared to separation from the substrate in order to provide more complete quantitative results useful in further evaluations and assessments of the device.
4. Care shall be noted to ensure that all anomalous conditions have been resolved prior to shear testing and destruction of the evidence.

**DPA PLANNING SHEET****APPENDIX H-1****RELAYS****DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):****MIL-STD-1580 REV. A SEC 12**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>PARA. 12.1.1.1</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>DELID <u>1/</u></b>	<b>PARA. 12.1.1.4</b>	<b>ALL</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 12.1.1.6a, c-g &amp; NOTES <u>2/</u>, <u>3/</u></b>	<b>ALL</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.6</b>	<b>ONE MINIMUM</b>
<b>WELD PULL TEST</b>	<b>PARA. 12.1.1.6f</b>	<b>ALL</b>
<b>HIGH TEMPERATURE SOLDER VERIFICATION <u>4/</u></b>	<b>PER NOTE <u>4/</u></b>	<b>ONE</b>
<b>ENGINEERING REVIEW</b>		

**NOTES:**

- 1/ Paragraph 12.1.1.5 of MIL-STD-1580A (microcleanliness inspection) has been removed intentionally by this drawing.
- 2/ Paragraph 12.1.1.6b of MIL-STD-1580A has been removed intentionally by this drawing.
- 3/ Verify that the coil wire diameter is larger than 44 AWG.
- 4/ Verify that high temperature solder was utilized on the existing solder joint if applicable. Use methods defined in MIL-STD-1580A paragraph 5.1.1.4

**DPA PLANNING SHEET****APPENDIX I-1****RESISTOR METALLIZED FIXED FILM****DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):****MIL-STD-1580 REV. A SEC 13.3**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>PARA. 13.3.1.1</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>DECAPSULATION</b>	<b>PARA. 13.3.1.3.1 AND PARA. 13.3.1.3.2 A OR B</b>	<b>ALL</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 13.3.2</b>	<b>ALL</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.6</b>	<b>ONE MINIMUM</b>
<b>END CAP REMOVAL</b>	<b>PARA. 13.3.1.4</b>	<b>ALL</b>
<b>SEM EXAMINATION</b>	<b>AS REQUIRED PER PARA. 13.3.1.3.1</b>	<b>ONE MINIMUM</b>
<b>ENGINEERING REVIEW</b>		

**DPA PLANNING SHEET****APPENDIX I-2****RESISTOR, METAL FOIL****DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):****MIL-STD-1580 REV. A SEC 13.4**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>MIL-STD-1580 PARA. 13.3.1.1</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>DECAPSULATION</b>	<b>PARA. 13.4.1.4 A OR B</b>	<b>ALL</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 13.4.3</b>	<b>ALL</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENGINEERING REVIEW</b>		

**DPA PLANNING SHEET****APPENDIX I-3****RESISTOR NETWORK****DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):****MIL-STD-1580 REV. A SEC 13.6**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>MIL-STD-1580 PARA. 13.6.1.1</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>PULL TEST (MOLDED PACKAGE STYLES ONLY)</b>	<b>PARA. 13.6.1.3</b>	<b>1/3 OF SAMPLES</b>
<b>DELID/DECAPSULATION</b>	<b>PARA. 13.6.1.4 A THRU D</b>	<b>ALL</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 13.6.1.5 AND 13.6.3 THRU 13.6.3.7</b>	<b>ALL</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>BOND PULL TESTING (IF APPLICABLE)</b>	<b>MIL-STD-883 METHOD 2011 COND. D</b>	<b>ALL</b>
<b>PASSIVE ELEMENT SHEAR (IF APPLICABLE)</b>	<b>SSQ 25000 APPENDIX G-2</b>	<b>ALL</b>
<b>ENGINEERING REVIEW</b>		

**DPA PLANNING SHEET****APPENDIX I-4****RESISTOR, WIREWOUND ACCURATE****DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):****MIL-STD-1580 REV. A SEC 13.7**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>MIL-STD-1580 PARA. 13.7.1.1</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>DECAPSULATION</b>	<b>PARA. 13.7.1.2.2</b>	<b>2/3 OF SAMPLES</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 13.7.1.3 AND 13.7.3</b>	<b>2/3 OF SAMPLES</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.6</b>	<b>ONE MINIMUM</b>
<b>ENCAPSULATION</b>	<b>PARA. 13.7.1.2.1</b>	<b>1/3 OF SAMPLES</b>
<b>CROSS SECTION</b>	<b>PARA. 13.7.1.2.1</b>	<b>1/3 OF SAMPLES</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 13.7.1.3 AND 13.7.3</b>	<b>1/3 OF SAMPLES</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENGINEERING REVIEW</b>		

**DPA PLANNING SHEET****APPENDIX I-5****RESISTOR, FIXED WIREWOUND**

**DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):**

**MIL-STD-1580 REV. A SEC 13.8**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>MIL-STD-1580 PARA. 13.8.1.1</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>DECAPSULATION/ DISASSEMBLE</b>	<b>PARA. 13.8.1.2.1 OR 13.8.1.2.2</b>	<b>ALL</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 13.8.3</b>	<b>ALL</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.6</b>	<b>ONE MINIMUM</b>
<b>ENGINEERING REVIEW</b>		

**DPA PLANNING SHEET****APPENDIX I-6****RESISTOR, FIXED CHIP**

**DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):**

**MIL-STD-1580 REV. A SEC 13.5**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>PARA. 13.5.1.1 &amp; 13.5.3</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENGINEERING REVIEW</b>		

**DPA PLANNING SHEET****APPENDIX J-1****SWITCH, SNAP ACTION****DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):****MIL-STD-1580 REV. A SEC 14.1**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>PARA. 14.1.1.2 A, B, C, &amp; D</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>DISASSEMBLY</b>	<b>PARA. 14.1.1.4</b>	<b>ALL</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 14.1.1.5 A THRU D</b>	<b>ALL</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.6</b>	<b>ONE MINIMUM</b>
<b>ENGINEERING REVIEW</b>		

**DPA PLANNING SHEET****APPENDIX J-2****THERMAL SWITCH**

**DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):**

**MIL-STD-1580 REV. A SEC 14.2**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>PARA. 14.2.1.2</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>DELID <u>1/</u></b>	<b>PARA. 14.2.1.4</b>	<b>ALL</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 14.2.1.6</b>	<b>ALL</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENGINEERING REVIEW</b>		

**NOTES:**

**1/ Paragraph 14.2.1.5 of MIL-STD-1580A (microcleanliness inspection) has been intentionally removed from this drawing.**

**DPA PLANNING SHEET****APPENDIX K-1****THERMISTOR, GLASS BODIED, HERMETIC****DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):****MIL-STD-1580 REV. A SEC 15.1**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>MIL-STD-1580 PARA. 15.1.1.1</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENCAPSULATION</b>	<b>PARA. 15.1.1.4</b>	<b>ALL</b>
<b>CROSS SECTION</b>	<b>PARA. 15.1.1.4</b>	<b>ALL</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 15.1.1.5 AND 5.1.3</b>	<b>ALL</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENGINEERING REVIEW</b>		

**DPA PLANNING SHEET****APPENDIX K-2****THERMISTOR, DISC and BEAD, ENCAPSULATED****DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):****MIL-STD-1580 REV. A SEC 15.2**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>PARA. 15.2.1.1</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>DECAPSULATION</b>	<b>PARA. 15.2.1.3</b>	<b>50% ROUND UP</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 15.2.1.4 AND 15.2.3</b>	<b>50% ROUND UP</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENCAPSULATION</b>	<b>PARA. 15.2.1.3 AND 15.2.1.4</b>	<b>REMAINING SAMPLES</b>
<b>CROSS SECTION</b>	<b>PARA. 15.2.1.3 AND 15.2.1.4</b>	<b>REMAINING SAMPLES</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>PARA. 15.2.1.4 AND 15.2.3</b>	<b>REMAINING SAMPLES</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>ENGINEERING REVIEW</b>		

**DPA PLANNING SHEET****APPENDIX L-1****TRANSISTORS & METAL CAN DIODES****DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):****MIL-STD-1580 REV. A SEC 16/MIL-STD-750/MIL-STD-883**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>16.1.1.2</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5</b>	<b>ONE MINIMUM</b>
<b>P.I.N.D. TESTING <u>1/</u></b>	<b>MIL-STD-750 METHOD 2052</b>	<b>ALL</b>
<b>RGA</b>	<b>MIL-STD-883 METHOD 1018</b>	<b>ONE DEVICE PROVIDED IN ADDITION TO THE DPA SAMPLES</b>
<b>DELID</b>	<b>PARA. 16.1.1.5</b>	<b>ALL</b>
<b>INTERNAL VISUAL INSPECTION <u>2/</u></b>	<b>MIL-STD-750 METHOD 2072.2 OR 2074</b>	<b>ALL</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>ONE OVERALL DIE PHOTO, ONE OVERALL DIE CAVITY PHOTO</b>	<b>ONE MINIMUM</b>
<b>BOND PULL TESTING</b>	<b>MIL-STD-750 METHOD 2037</b>	<b>ALL</b>
<b>GLASSIVATION REMOVAL</b>	<b>STANDARD LABORATORY PROCEDURE</b>	<b>50% ROUND UP</b>

**DPA PLANNING SHEET****APPENDIX L-1 (continued)****TRANSISTORS & METAL CAN DIODES**

**DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):  
MIL-STD-1580 REV. A SEC 16/MIL-STD-750/MIL-STD-883**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>SEM ANALYSIS <u>3/</u></b>	<b>MIL-STD-750 METHOD 2077</b>	<b>50% ROUND UP</b>
<b>DIE SHEAR TESTING</b>	<b>MIL-STD-750 METHOD 2017</b>	<b>ALL</b>
<b>ENGINEERING REVIEW</b>		

**NOTES:**

**1/ P.I.N.D testing is required only on power devices in metal cans that dissipate more than 5 watts of power and shall be identified as such by the tier i or subtier contractor.**

**2/ For transistors refer to MIL-STD-750, METHOD 2072: for metal can diodes refer to MIL-STD-750, Method 2074.**

**3/ Photodocumentation required on one device only. Photographs will be representative of worst case conditions noted. Two photos are required of worst metallization steps along with one general metallization photograph.**

**DPA PLANNING SHEET****APPENDIX M-1****THICK FILM FUSES****DPA TESTING PERFORMED IN ACCORDANCE  
WITH THE FOLLOWING DOCUMENT(S):****SSQ 25000**

<b>TASK DESCRIPTION AND SEQUENCE</b>	<b>DOCUMENT - METHOD AND CONDITION</b>	<b>QUANTITY PERFORMED ON WITHIN DPA SAMPLE PERFORMED TO</b>
<b>EXTERNAL VISUAL INSPECTION</b>	<b>PER APPLICABLE REQUIREMENTS OF MIL-F-23419</b>	<b>ALL</b>
<b>EXTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5 OF MIL-STD-1580A</b>	<b>ONE MINIMUM</b>
<b>RADIOGRAPHY (REFERENCE ONLY)</b>		
<b>DELID</b>	<b>SSQ 25000 TEST PROCEDURE PARA. 3.0</b>	<b>ALL</b>
<b>INTERNAL VISUAL INSPECTION</b>	<b>SSQ 25000 TEST PROCEDURE PARA. 4.0</b>	<b>ALL</b>
<b>INTERNAL PHOTODOCUMENTATION</b>	<b>PARA. 4.5 OF MIL-STD-1580A</b>	<b>ONE MINIMUM</b>
<b>ENGINEERING REVIEW</b>		

**APPENDIX M-2**

## Thick Film Fuse DPA Testing Requirements

1. EXTERNAL VISUAL INSPECTION. Examine the fuse for defects in the external construction in accordance with the applicable requirements of MIL-F-23419 as applicable.
2. RADIOGRAPHY. Perform radiography in two perpendicular planes to determine the orientation of the substrate in the case for reference as delidding.
3. DELID. Lap the case material of sample unit to the surface of the substrate opposite the lead attachments and examine them at 10X minimum power magnification as follows:
  - 3.1. Inspect the deposited resistance element for adequacy of adhesion to the substrate.
  - 3.2. Inspect the metallization bonding areas for adequacy of alignment and adhesion to the resistance element.
  - 3.3. Remove remaining case material with a suitable chemical depotting agent and inspect the lead solder connections for smoothness and proper wetting.
4. INSPECTION CRITERIA. There shall be no evidence of:
  - 4.1. Cracks in the resistance element.
  - 4.2. lifting of the resistance element.
  - 4.3. Inadequate alignment of the metallization bonding area.
  - 4.4. Inadequate adhesion of the metallization bonding areas to the resistance element.
  - 4.5. There shall be no evidence of cracks in the solder joints.