

# LMSSC PACKAGING STANDARD

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## PACKAGING FOR PRINTED WIRING BOARD (PWB)

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### 1. SCOPE

This standard provides methods for packaging printed wiring boards (PWBs). This standard applies to shipments from Lockheed Martin Space Systems Company (LMSSC) facilities and from suppliers to LMSSC facilities. Exceptions or additional requirements shall be specified by the purchase order or work instruction.

### 2. APPLICABLE DOCUMENTS

The following documents, of the latest issue, form a part of this standard to the extent specified herein.

#### 2.1. LMSSC DOCUMENTS

P-40	General Requirements and Commercial Packaging
MAP-441008	Protection of Electrostatic Discharge Sensitive (ESDS) Devices

#### 2.2. GOVERNMENT DOCUMENTS

MIL-PRF-131	Barrier Materials, Watervaporproof, Greaseproof, Flexible, Heat-Sealable
MIL-PRF-22191	Barrier Material, Transparent, Flexible, Heat-Sealable
MIL-D-3464	Desiccants, Activated, Bagged, Packaging Use and Static Dehumidification
MS20003	Indicator, Humidity, Card, Three Spot, Impregnated Areas (Cobaltous Chloride)
PPP-C-795	Flexible Closed Cell Plastic Film (Bubble Pack)
A-A-59135	Polyethylene or Polypropylene Sheet Material (Microfoam Sheeting)
A-A-3174	Plastic Sheet, Polyolefin

#### 2.3. INDUSTRY DOCUMENTS

ESD S541-2008	Packaging Materials for ESD Sensitive Items
ESD S8.1-2007	Symbols – ESD Awareness

### 3. REQUIREMENTS

#### 3.1. GENERAL

- 3.1.1. If there are any conflicts between this documents requirements and released engineering, the released engineering takes precedence.
- 3.1.2. The requirements of P-40, General Requirements for Commercial Packaging, also apply.
- 3.1.3. The quantity per unit package shall be one (1) each.
- 3.1.4. Any loose item(s) required per part shall be enclosed in a separate bag.

- 3.1.5. For purposes of this standard, printed wiring boards (PWBs) are not populated with components.

### **3.2. UNIT PACKAGING**

#### **3.2.1. Option 1 – Mechanical Protection**

- 3.2.1.1. Completely wrap PWB with neutral white jeweler's tissue, non-antistatic bubble pack (ref: PPP-C-795) or microfoam sheeting (ref: A-A-3174).
- 3.2.1.2. Place wrapped board in a transparent plastic bag.
- 3.2.1.3. Expel excess air from bag prior to sealing.
- 3.2.1.4. Close bag by heat sealing (preferred method) or taping. Use only pressure-sensitive plastic tape. Allow sufficient material to permit at least one additional re-seal.

#### **3.2.2. Option 2 – Watervaporproof Protection with Desiccant**

- 3.2.2.1. Wrap PWB with clean polyethylene film (ref: A-A-3174) or jewelers tissue.
- 3.2.2.2. Construct watervaporproof heat-sealed bags from materials conforming to MIL-PRF-131 Class 1 or MIL-PRF-22191 Type I, Class 1. Note: Alternate barrier materials may be used if the water vapor transmission rate (WVTR) is no greater than 0.02 grams/100 square inches/24 hours as measured by MIL-STD-3010 Method 3030.
- 3.2.2.3. Unless otherwise specified, use desiccant per MIL-D-3464, Type II. Desiccant is in standard unit-sized bags (1 unit = 1 ounce). Unless otherwise specified on the engineering drawing, the minimum quantity of desiccant used shall be at least the lesser of 2 units per 1 cubic foot or 2 units per 1 square foot of container or bag.
- 3.2.2.4. Do not unnecessarily expose the desiccant to the ambient environment when it is removed from its sealed storage container. Make the removal of the desiccant and its insertion into the unit pack the last action prior to final sealing of the bag or container.
- 3.2.2.5. Strategically locate the desiccant in the pack so as not to be load bearing. Ensure the desiccant is adequately secured to prevent its shifting or movement. Do not permit desiccant to come in direct contact with critical surfaces of the enclosed item.
- 3.2.2.6. Place humidity indicator cards immediately within the closure seal of the container. Humidity indicator plugs can be used in lieu of cards—if used, they shall be installed in the watervaporproof barrier flim. Humidity indicator cards shall conform to MS20003. Humidity indicator plug shall conform to AS26860.

#### **3.2.3. Option 3 – Electrostatic Discharge Protection**

- 3.2.3.1. Typically, PWBs are not electrostatic sensitive devices (ESD). If the PWB is ESD, package and label in accordance with MAP-441008 or ESD S541-2008.

### **3.3. INTERMEDIATE PACKAGING**

- 3.3.1. Pack unit packages containing identical items uniformly into fiberboard containers. Pack documentation, coupons and samples separately. Protect the individual unit pack bags with layers of bubble wrap or sheets of cushioning.

- 3.3.2. Fill voids with suitable dunnage to prevent damage during handling and transportation.

**3.4. PACKING**

- 3.4.1. Pack any number of intermediate containers uniformly into each shipping container.
- 3.4.2. Shipping containers, as packed, shall protect each item and package during ordinary handling and transportation. Shipping containers shall meet the minimum requirements of the common carriers for acceptance for safe transportation.
- 3.4.3. Intermediate containers which meet the requirements of Section 3.4.2 may be used as shipping containers.
- 3.4.4. Enclose or attach a copy of the packing slip to the shipping container.

**3.5. MARKING**

- 3.5.1. Marking shall be in accordance with the requirements specified in the purchase order or part specification.
- 3.5.2. Special handling, precautionary markings, etc., shall be applied as required. Special and precautionary handling labels should be selected using the guidance of ASTM D5445, Pictorial Marking for Handling of Goods.
- 3.5.3. ESD marking and labeling shall be applied in accordance with MAP-441008 or ESD S8.1-2007.

**3.6. QUALITY ASSURANCE**

Packaging shall be accomplished in such a manner as to prevent physical damage to, or degradation of, the packaged items during delivery to the using activity. It shall be the prerogative of LMSSC to return damaged items, at supplier's expense, when such damage is attributable to inadequate or improper protection.

**4. NOTES**

If assistance is required, contact LMSSC Product Protection Engineering at (303) 971-1333 or (408) 742-2200.

**P-131**

Revision 3  
06/19/2012  
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**REVISION HISTORY**

<b>Release Date</b>	<b>Rev</b>	<b>Change Description</b>	<b>Responsible Engineer</b>
Unknown	0	Original Release	Tom Shanley
Unknown	1	Unknown	Tom Shanley
09-02-2008	2	Revised Section 3.5, Marking; Section 4.0, Quality Assurance; and Section 5.0 References	Allen Elsmore
06-19-2012	3	Complete rewrite driven by PE CAB VI12-004 and Incident Report IR12-015. Three packaging methods now allowed (Mechanical Protection, Watervaporproof Protection with Desiccant and ESD Protection). Figure 1 removed. Refer to Job Folder 12070.	Bill Manning

**APPROVALS**

<b>Approvers</b>	<b>Disciplines</b>	<b>Date: MM-DD-YYYY</b>
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Jacob Rowe	PSE – EMF – Denver	06-05-2012
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