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## PACKAGING OF NON-ELECTROSTATIC DISCHARGE SENSITIVE (NON-ESDS) DEVICES, PARTS AND COMPONENT ASSEMBLIES

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### **1.0 SCOPE**

This standard provides methods for the protection of solid state devices parts/components.

#### **NOTE**

This document supersedes/replaces LMSC Packaging Standards P-19F and P-74E.

#### **IMPORTANT**

SUPPLIERS ARE REQUESTED TO REVIEW THE SPECIFIC ITEMS METHOD OF PACKAGING (SEE PARAGRAPH 3.0, AS APPLICABLE), AND THE MATERIAL REQUIREMENTS SPECIFIED (SEE PARAGRAPH 5.0), AND USE THE PROPER TYPE(S) OF PACKAGES/MATERIALS, TO MEET THE REQUIREMENTS OF THIS STANDARD.

#### **CAUTION**

PACKAGES THAT DO NOT CONFORM TO THE REQUIREMENTS OF THIS STANDARD ARE SUBJECT TO REJECTION AND RETURN TO THE SUPPLIER AT THE SUPPLIER'S EXPENSE.

### **2.0 REFERENCES**

#### **2.1 LMSC DOCUMENTS**

2.1.1 LPS 40-001, LMSC Packaging Standard, "General Requirements Specification"

#### **2.2 GOVERNMENT/MILITARY DOCUMENTS**

- 2.2.1 MIL-M-55565, "Microcircuits, Packaging of"
- 2.2.2 MIL-S-19500, "Semiconductor Devices, General Specification for"
- 2.2.3 MIL-R-39032, "Resistors, Packaging of"
- 2.2.4 MIL-S-19491, "Semiconductor Devices, Packaging of"
- 2.2.5 MIL-M-38510, "Microcircuits, General Specification for"
- 2.2.6 MIL-STD-129, "Marking for Shipment and Storage"

### **3.0 REQUIREMENTS**

#### **3.1 GENERAL**

#### **NOTE**

- Use of carbon loaded materials is not allowed due to their contaminating qualities.
- If requested by LMSC, suppliers must produce written certification of compliance of required materials conforming to this specification.

3.1.1 The requirements of LPS 40-001 shall be met in addition to provisions of this packaging standard.

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- 3.1.2 Unless otherwise specified, the quantity per unit package shall be one (1) each. Items shall be clean and free of foreign matter/contaminants injurious to its function/performance.
- 3.1.3 Suppliers may utilize an alternate blister package in place of the LMSC blister package providing the package meets the following requirements:
  - a. Design will insure proper protection and fit of device.
  - b. Cover properly seats and securely locks both halves together.
  - c. There is tearaway perforation between unit packages for breakaway capability.
  - d. All other requirements of this standard are met.

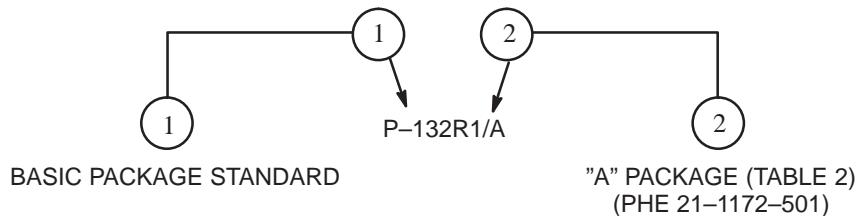
**CAUTION**

SUPPLIER'S FAILURE TO COMPLY WITH THESE REQUIREMENTS SHALL SUBJECT THEIR SHIPMENT(S) TO POSSIBLE REJECTION AND RETURNED TO THE SUPPLIER AT THE SUPPLIER'S EXPENSE.

- 3.1.4 Containers/packages shall be of good quality consistent with acceptable commercial standards and workmanship.
- 3.1.5 When lot date identity is specified, do not intermix items from different lots and/or lot dates within the same intermediate container/package.

**NOTE**

The basic packaging standard may also identify a specific package type and size. Example:


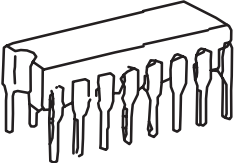
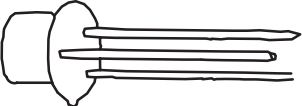
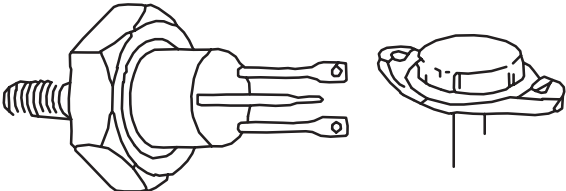
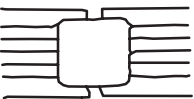

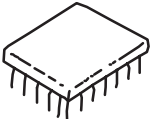
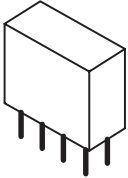


Consult Table 2 , Table 3 and Table 4 for package sizes available and see source chart for list of suppliers.

**PACKAGING OF NON-ELECTROSTATIC DISCHARGE SENSITIVE (NON-ESDS) DEVICES, PARTS AND COMPONENT ASSEMBLIES**

3.2 DEVICE/PACKAGING INDEX

**Table 1**

Device Type	Device Typical Illustration	Package*	Paragraph
Axial Lead		Blister Figure 1 Table 2	3.3.1 or 3.1.3
Dual-in-Line		Blister Figure 2 Table 3	3.3.2 or 3.1.3
"To" Can		Blister Figure 3 Table 4	3.3.3 or 3.1.3
Stud/Flange or Special Style		Various	3.3.4
Flat		Special Carrier	3.3.5
Radial		Various	3.3.6
Pin Grid Array		Plastic Box	3.3.7
Electro-mechanical		Folding Box	3.3.8.4

\*See applicable Table for blister size (package type), Paragraph 5.0 for supplier sources, and Paragraph 3.1.3 for alternate blister package.

**PACKAGING OF NON-ELECTROSTATIC DISCHARGE SENSITIVE (NON-ESDS) DEVICES, PARTS AND COMPONENT ASSEMBLIES**

**3.3 UNIT PACKAGING REQUIREMENTS**

**3.3.1 Axial Lead Device**

Insert device individually into cavity provided by Blister Package (PHE 21-1172), 10 cavities/strip, assure that device fits cavity so that the cover properly seats and securely locks both halves together. Do not fold over or bend blister strip. (See paragraph 3.1.3 or 3.3.8 for an alternate packaging method.)

Table 2		
Package	Fits Axial Devices with Maximum Dimensions to:	LMSC Drawing
A	.500 Body Length .250 Body Diameter 1.50 Lead Length (2 places)	PHE 21-1172-501
B	.875 Body Length .375 Body Diameter 1.50 Lead Length (2 places)	PHE 21-1172-503
C	1.312 Body Length .500 Body Diameter 1.625 Lead Length (2 places)	PHE 21-1172-505

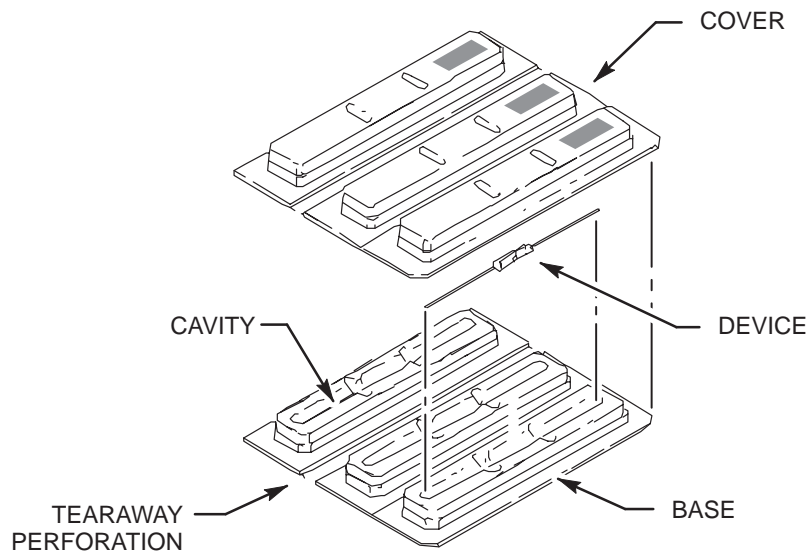


Figure 1. Axial Lead Plastic Blister PHE 21-1172

**PACKAGING OF NON-ELECTROSTATIC DISCHARGE SENSITIVE (NON-ESDS) DEVICES, PARTS AND COMPONENT ASSEMBLIES**

3.3.2 Dual-In-Line (DIL) Device

Insert device individually into cavity provided by Blister Package (PHE 21-1184), 10 cavities/strip; assure that the cover properly seats and securely locks both halves together. Do not fold over or bend blister strip. (See paragraph 3.1.3 or 3.3.8 for an alternate packaging method.)

Table 3		
Package	Fits DIL Device with Maximum Dimensions to:	LMSC Drawing
D	1.0" Long .625" Width .375" Depth	PHE 21-1184-501
E	2.187" Long .875" Width .562" Depth	PHE 21-1184-503

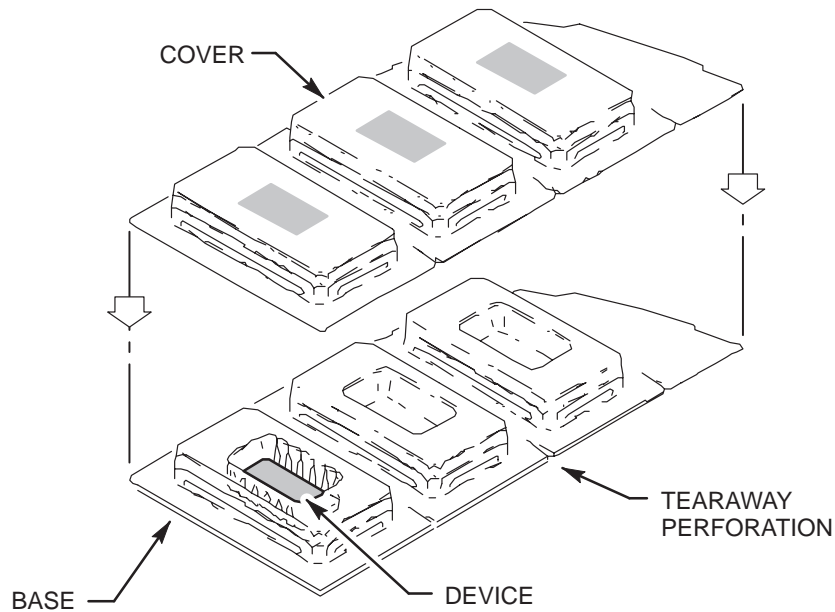


Figure 2. Dual-in-Line Plastic Blister PHE 21-1184

**PACKAGING OF NON-ELECTROSTATIC DISCHARGE SENSITIVE (NON-ESDS) DEVICES, PARTS AND COMPONENT ASSEMBLIES**

3.3.3 "To"-Style Can Device

Insert device individually into cavity provided by Blister Package (PHE 21-1183), 10 cavities/strip; assure that the cover properly seats and securely locks both halves together. Do not fold over or bend blister strip. (See paragraph 3.1.3 or 3.3.8 for an alternate packaging method.)

Table 4		
Package	Fits "TO" Device Maximum Dimensions to:	LMSC Drawing
F	2.125" Long (Can/Lead) .275" Diameter (Can) 1.55" Lead Length	PHE 21-1183-501
G	2.125" Long (Can/Lead) .400" Diameter (Can) 1.55" Lead Length	PHE 21-1183-503

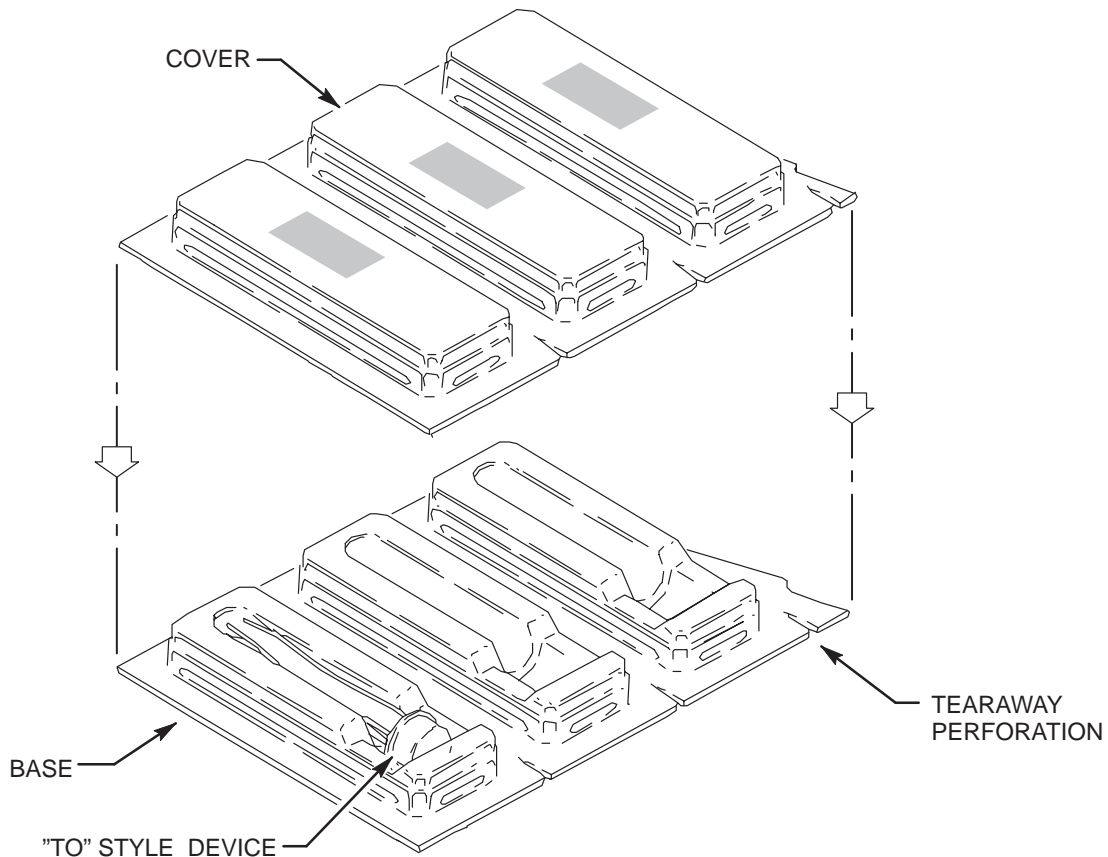


Figure 3. "TO" CAN Plastic Blister PHE 21-1183

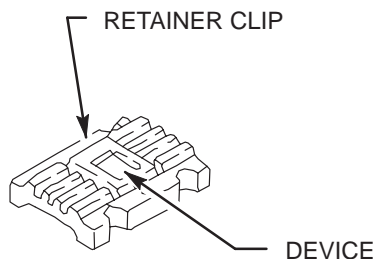
## PACKAGING OF NON-ELECTROSTATIC DISCHARGE SENSITIVE (NON-ESDS) DEVICES, PARTS AND COMPONENT ASSEMBLIES

### 3.3.4 Stud, Flange or Special Style Devices

Protect leads/pins from bending or deforming by blocking within the unit container, box or vial. Fill void with foam cushioning or formed inserts. Close and secure openings as appropriate. Tape box lids with approximately 1/2" wide x 1" long tape.

### 3.3.5 Flat Pack Devices

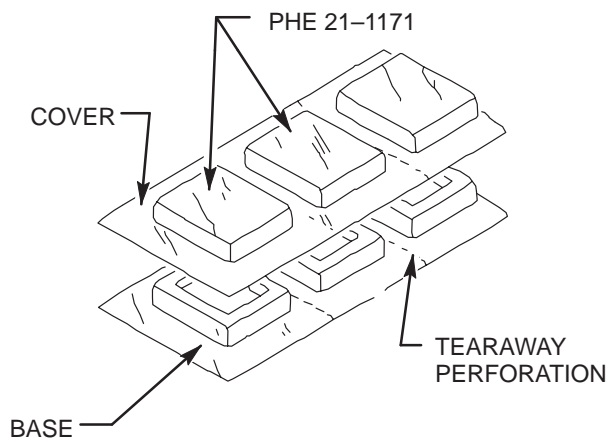
Insert device with standard lead configuration into appropriate size/type carrier (see illustration).



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#### NOTE

Place carrier in plastic blister, 10 cavities/strip (PHE 21-1171), or individually into a plastic bag. DO NOT FOLD OVER OR BEND BLISTER STRIP. Close bag by heat sealing. Allow sufficient material to accomplish at least one additional reseal. Staples not permitted. This overpack is necessary since carrier is too small for required marking/labeling.

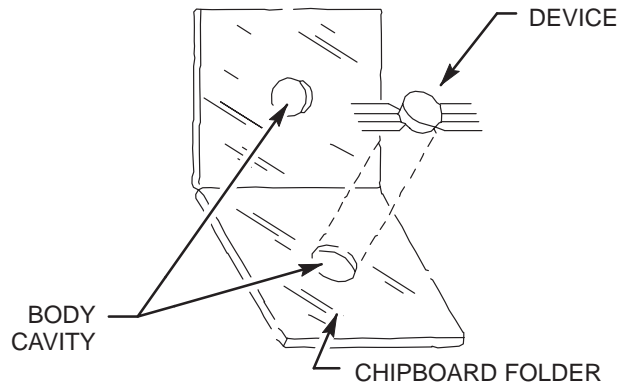


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#### OR

Devices may be packaged in a protective chipboard (foil laminate) folder (see illustration). Seal with clip or tape. Staples not permitted. Protective chipboard (foil laminated) may be placed in plastic box with cushioning or bag. Close bag by heat sealing. Allow sufficient material to accomplish at least one additional reseal. Staples not permitted.

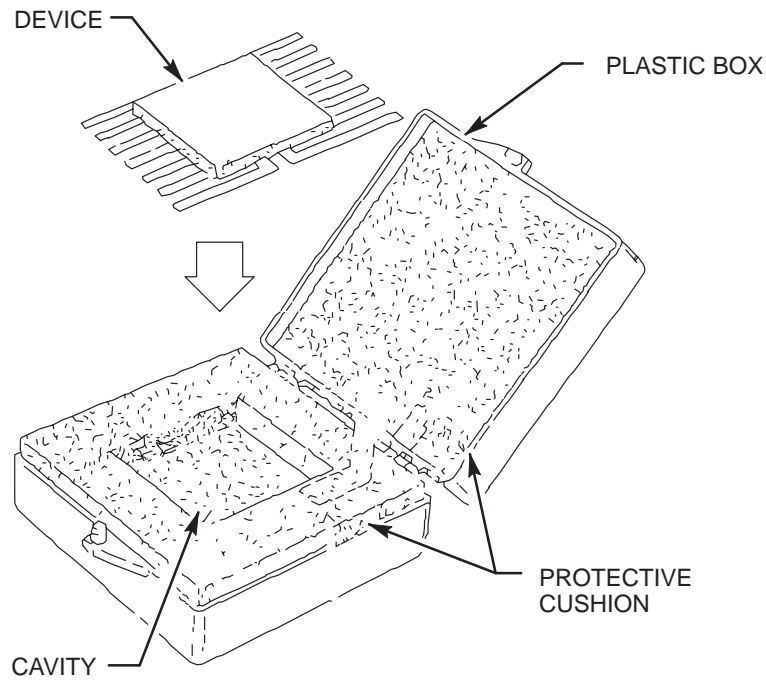
## PACKAGING OF NON-ELECTROSTATIC DISCHARGE SENSITIVE (NON-ESDS) DEVICES, PARTS AND COMPONENT ASSEMBLIES



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**OR**

Center each device between 2 pieces of foam with a cavity cut to fit the device (see illustration). Assure that the exposed leads are properly protected from damage. Enclose cushioned device in a plastic box, size commensurate with the dimensions of the cushioning. Close box and seal lid with tape approximately 1/2" wide x 1" long.



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### **CAUTION**

**AVOID PUTTING EXCESSIVE PRESSURE ON DEVICE WHEN LID IS CLOSED.**

#### 3.3.6 Radial Lead Devices

Insert a single device in a vial or extrusion, fill void to restrict movement with cushioning material. Close and secure opening as appropriate.



## PACKAGING OF NON-ELECTROSTATIC DISCHARGE SENSITIVE (NON-ESDS) DEVICES, PARTS AND COMPONENT ASSEMBLIES

### 3.3.7 Pin Grid Array Devices

Fold a single piece of foam around each device. The foam should completely cover both the top and bottom of the part. Enclose cushioned device in a plastic box, size commensurate with the dimensions of the cushioning. Close box and seal lid with tape approximately 1/2" wide x 1" long.

### 3.3.8 Alternate Packaging – Nonblister

Unless otherwise specified, the following packaging methods are acceptable in lieu of Blister Packages defined in Paragraphs 3.3.1, 3.3.2 and 3.3.3 (When possible, LMSC would prefer blister packages.)

#### 3.3.8.1 Axial Lead Devices

Insert a single device into a plastic bag (plain or cushioned); close by heat seal or self-seal. Allow sufficient material to accomplish at least one additional reseal. Staples not permitted. Fold/roll bagged device and insert into a vial or extrusion. Close/seal openings with proper caps or covers.

### CAUTION

DO NOT BEND OR DEFORM LEADS.

#### 3.3.8.2 Dual-In-Line Devices

Protect soft thin leads from bending or deforming by blocking individually within the plastic box or vial with foam cushioning/formed inserts. Close box and seal lid with tape approximately 1/2" wide x 1" long.

Devices with rigid leads may be individually enclosed in plastic bags, vials, extrusions or boxes, size commensurate with device. Fill void with cushioning material to restrict device movement if required. Close bag by heat seal. Allow sufficient material to accomplish one additional reseal. Staples not permitted. Close vials and extrusion openings as appropriate. Tape box lids with approximately 1/2" wide x 1" long tape.

#### 3.3.8.3 "To" Style Can, Stud, Flange Devices

Package device in accordance with selected method shown for dual-in-line devices specified immediately above.

#### 3.3.8.4 Electro-mechanical Devices

Fold a single piece of foam around each device. The foam should completely cover both the top and bottom of the part. Enclose cushioned device in a folding box, size commensurate with the dimensions of the cushioning. Close box and seal lid with tape approximately 1/2" wide x 1" long.

#### 3.3.8.5 Various Devices

Immobilize device in plastic box. Include cushioning material of sufficient density/thickness to protect device during shipment/handling. Close box and seal lid with tape approximately 1/2" wide x 1" long.

### 3.4 INTERMEDIATE PACKAGE (CONSOLIDATION OF UNIT PACKAGES WHEN APPLICABLE)

3.4.1 Do not bend or fold blister strips to consolidate.

3.4.2 Unless otherwise specified, the quantity of unit packages and the type of intermediate container is optional. However, when lot identity is required, lots shall not be intermixed within the same container.

3.4.3 When applicable, fill all voids with suitable dunnage, blocking, or bracing to prevent damage during handling/shipment.

### 3.5 PACKING (SHIPPING CONTAINER)

3.5.1 Do not bend or fold blister strips for packing if intermediate package is not used.

3.5.2 Pack unit/intermediate packages uniformly into shipping container. Include adequate dunnage to protect the items during handling/shipment.

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3.5.3 Shipping container as packed shall assure protection of items and packages during ordinary handling and shipping and shall meet the minimum requirements of the common carrier for acceptance for safe transportation at the lowest rate to the point of delivery. Attach or enclose a copy of packing slip with the shipping container.

**3.6 UNIT PACKAGE MARKING**

Unless otherwise specified, apply pressure-sensitive labels that permanently adhere to each blister package, individual segment, etc. Marking shall be clear and legible.

Label must show part number per contracting document, manufacturer’s name (may be abbreviated but logo is not acceptable), lot date code (LDC), if applicable. Additional markings may be specified in the item detail specification, drawing or purchase order.

Apply special labels as applicable, i.e., "Protected with Tarnish Inhibitor – Do Not Open Until Ready for Use or Inspection", etc.

**3.7 INTERMEDIATE PACKAGING MARKING**

Label or mark each intermediate package in a clear and legible manner to show part number per contracting document, manufacturer’s name (may be abbreviated but logo is not acceptable), and quantity within the intermediate package. Apply special labels as applicable.

**3.8 MARKING OF SHIPPING CONTAINERS**

Label or mark each container to show part number per contracting document, supplier’s name, total quantity within shipping container, LMSC contracting document number and destination.

Special precautionary and handling markings shall be applied as required.

**4.0 QUALITY ASSURANCE**

Packages, materials or marking which does not conform to the requirements of this standard are subject to rejection and return to supplier at his expense.

**5.0 NOTES**

<u>Commodity</u>	<u>Sources*</u>
Plastic Blister Package,	3, 4
“Axial Lead,” PHE 21-1172	3, 4
“TO Can,” PHE 21-1183	3, 4
“Dual-In-Line,” PHE 21-1184	3, 4
“Barnes/Wells Carrier,” PHE 21-1171	3, 4
Plastic Vial	3, 6
Bags, Plastic	1, 2, 3, 5, 9
Box, Corrugated, PPP-B-636	1, 2, 3, 5
Box, Folding, PPP-B-566	1, 2, 3, 5
Plastic, Carrier, Flatpack	8
Cushioning	1, 2, 5, 9, 13
Cushioning, Cellular	1, 3, 5, 9
Edge Protector	1, 3, 9, 10
Folder, Foil Laminate (Flatpack) Board	11, 12

\*See Source Chart

**PACKAGING OF NON-ELECTROSTATIC DISHCARGE SENSITIVE  
(NON-ESDS) DEVICES, PARTS AND COMPONENT ASSEMBLIES**

**SOURCE CHART FOR LMSC BLISTER PACKAGES  
(CHART UPDATE 3-26-86)  
(See NOTE Below)**

Supplier No.	Supplier	Location
1	Biggam Enterprises	San Jose, CA
2	Ward-Bagby	Milpitas, CA
3*	Colvin Packaging Products, Inc.	Anaheim, CA
4*	Fuzere Mfg Co. Inc.	Sunnyvale, CA
5	Noland Paper Co.	San Jose, CA
6	Olympic Plastics	Los Angeles, CA
7	Richmond Corp.	Redlands, CA
8	Wells Electronics	South Bend, IN
9	Controlled Static	Santa Fe Springs, CA
10	3M Co. Nuclear Products	So. San Francisco, CA
11	L. Gordon & Son Inc.	Baltimore, MD
12	Laminated Products	Santa Clara, CA
13	Sentinel Foam Products	Hyannis, MA
14	Perfection Mica Co.	Bensenville, IL

\*LMSC authorized manufacturer/distributor of LMSC Blister Packages

If further information or details are required pertaining to any part of this LMSC Standard, contact "Operations Packaging Engineering" through your LMSC Procurement Representative.

NOTE: This chart will be updated as new suppliers are approved, without affecting packaging specifications detailed in this standard. The latest chart revision date will be shown above as "Chart Update."