
SPECIAL CARRIER PACKAGE FOR INTEGRATED CIRCUITS AND SEMICONDUCTORS

1.0 SCOPE

This standard provides for the individual packaging of integrated circuits (flat-packs) or "TO" style semiconductor devices in special carriers for automated handling/testing.

2.0 REFERENCES

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

3.0 REQUIREMENTS

3.1 GENERAL

- 3.1.1 The requirements of LPS 40-001 shall be met in addition to provisions of this Packaging Standard.
- 3.1.2 The quantity per unit package shall be one (1) each.
- 3.1.3 Each device shall be inserted in the proper carrier designated to accommodate the style/type of device (see illustrations).
- 3.1.4 Each flat-pack type device shall be properly oriented in its carrier. Except for 6 and 10 lead devices, the No. 1 lead shall coincide with the No. 1 slot on the carrier (see Figure 3). Devices with 6 or 10 leads shall be inserted in carriers in accordance with the detail drawing/specification.
- 3.1.5 Each "TO" style device shall be properly oriented in its carrier.

NOTE: Except for the TO-18 device, the index tab on the device shall coincide with the polarization index on the carrier. The TO-18 device when properly positioned appears off-center on the carrier. (See Table 2, and Figure 1, for pin alignment.)

CAUTION: All devices shall be handled carefully to avoid deformation of the leads. Evidence of bent or misaligned leads, or other types of defects, may result in rejection and return of defective devices to the supplier.

- 3.1.6 Devices improperly oriented, mounted or otherwise handled/packaged contrary to this standard shall be subject to rejection.
- 3.1.7 The selection of the style/type of carrier used for the device shall be in accordance with the requirements of this standard.
- 3.1.8 Devices with exposed silver-plated surfaces shall be protected with tarnish-inhibitor material. Minimum surface area of the tarnish inhibitor shall be twice the area of the silver surface of the item.
NOTE: The treated side of the inhibitor must be facing the item(s).
- 3.1.9 When lot number identity is required, shipments of devices from different lots shall not be intermixed within the same intermediate package(s).

3.2 UNIT CARRIER

3.2.1 Flat-Pack Devices

Insert each device in the proper carrier (see Table 1). Assure that the device is properly oriented in the carrier per Paragraph 3.1.4 and that the correct retainer clip is used.

NOTE: Clips for preformed leads (029 - 268) differ from clips for straight leads (029 - 267) and care should be taken to assure that the proper clips are used. (Openings may be either circular or rectangular.)

3.2.2 "TO" Style Devices

Insert each device in the proper carrier selected from Table 2. Assure that the device is properly oriented in the carrier per Paragraph 3.1.5.

3.3 UNIT PACKAGING

3.3.1 Flat-Pack Devices

The unit package (Figure 5) shall consist of a two-piece plastic holding device which incorporates not more than ten individual, formed, rigid, transparent blisters or compartments, joined together in a manner providing “breakaway” or “cutaway” capability, permitting individual issue control. Each compartment (blister) shall contain one part in a unit carrier.

3.3.2 “TO” Style Devices

Package 1 unit carrier with device into folding/setup box, utilizing folding sleeve, tray or slotted partitions to prevent unit carrier movement (for example see Figure 2) or include sufficient neutral dunnage to prevent dislodgement/movement of device during handling or shipment. The package design shall permit safe and easy removal/replacement of device without damage.

NOTE: Other methods/materials may be used for a unit package providing that other requirements of this standard are met and such action does not result in any additional cost to LMSC.

NOTE: Do not fold over or bend blister strip(s).

3.3.3 Devices having exposed silver-plated surfaces shall be protected by tarnish inhibitor.

3.4 INTERMEDIATE PACKAGING – (Consolidation of unit packages, when applicable)

3.4.1 Unless otherwise specified, the number of unit packages per intermediate container (containing identical parts) shall be limited to the dimensions and gross weight provisions of the container specification (Ref Carrier Regulations).

3.4.2 Fill all voids with suitable dunnage, blocking or bracing to prevent damage during handling/shipment.

3.4.3 Do not fold over or bend blister strip(s) for packing.

3.5 PACKING

3.5.1 Pack unit or intermediate packages uniformly into shipping container(s); include adequate dunnage to protect the items during handling/shipment.

3.5.2 Shipping containers as packed shall protect each item and package during ordinary handling and shipping and shall meet the minimum requirements of the common carriers for acceptance for safe transportation at the lowest rate to the point of delivery.

3.5.3 Enclose or attach a copy of packing slip to the shipping container.

3.5.4 Do not fold over or bend blister strip(s) for packing.

3.6 MARKING

3.6.1 Unit Package Marking

Unless otherwise specified, apply pressure-sensitive label(s) to each individual package, blister 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 if applicable, i.e., “Thermal Control” per P-201 “Protected with Tarnish Inhibitor – Do Not Open Until Ready for Use or Inspection,” etc.

3.6.2 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 if applicable.

3.6.3 Shipping Container Marking

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 designation.

Special precautionary and handling markings shall be applied if required.

4.0 QUALITY ASSURANCE

- 4.1 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 LMSC to return damaged items, at supplier's expense, when such damage is attributable to improper or inadequate protection.

5.0 NOTES

The following information is intended as a guide or aid to suppliers in meeting the requirements of this specification:

- 5.1 This standard provides minimum protection of devices specified in the procurement document, during shipment from supplier to LMSC to facilitate automated test/inspection functions. Unless otherwise specified, when a conflict exists between the packaging provisions of this standard and a detail item specification/drawing referenced in a contractual document, the packaging requirements imposing a higher level of protection (long term storage, unique preservation/packaging, etc.), the requirements of the applicable specification/drawing shall take precedence.
- 5.2 **DEFINITION – Unprotected Silver Surfaces.** All metallic silver surfaces (having stringent reflectivity or conductivity requirements, close tolerance finishes and/or dimensions, without supplementary tarnish-resistant treatment), the deterioration of which may result in premature failure or malfunction of the item or equipment having such surfaces.

6.0 REFERENCES

- 6.1 Federal Specification QQ-S-365, "Silver Plating, Electrodeposited; General Requirements for"
- 6.2 Tarnish Inhibitor Source – Daubert Chemical Co., Oakbrook, IL

7.0 UNIT CARRIER SOURCES

Carrier – Amphenol/Barnes Corporation – Broadview, IL
Wells Electronics, Inc. – South Bend, IN

8.0 UNIT PACKAGE SOURCES (FIGURE 5)

LMSC Plastic Package Design (PHE 21-1171) – Colvin Packaging Products Inc., Anaheim, CA
For-Vac, Inc., Belmont, CA
Merrill's Packaging, Inc., Burlingame, CA

Table 1						
BARNES/AMPHENOL CARRIER IDENTITY – FLAT PACK DEVICES						
Device Body Max Size (inch)	Flat Packs Accepted – 2 Piece Snap-On Clip Type					Number of Leads
	Lead Shape	Min Lead Length	Max Lead Width	Clip No.	Carrier No.	
.125 x .250	Straight	.150	.025	029 – 267	029 – 040	14
.150 x .250	Straight	.140	.026	029 – 267	029 – 188	14
.187 x .250	Straight	.165	.025	029 – 267	029 – 527	14
.250 x .250	Straight	.100	.025	029 – 267	029 – 003	14
.235 x .250	Straight	.115	.025	029 – 267	029 – 403	14
.250 x .375	Straight	.100	.025	029 – 267	029 – 003	14
.125 x .250	Preformed	.120	.025	029 – 268	029 – 005	14
.235 x .250	Preformed	Special	.025	029 – 268	029 – 417	14
.250 x .375	Preformed	Special	.025	029 – 268	029 – 528	14
.285 x .455	Straight	.240	.019	029 – 267	01161 – 161	16
.670 x .385	Straight	.240	.019	02011 – 241	10071 – 241	24

Table 2				
SEMICONDUCTOR DEVICE				
Body Style (Case)	Number of Leads	Max Length Leads (inch)	Carrier No.	Pin Hole Number Use
TO-5	3	.625	132-01042-68	1, 3, 5
TO-18	3	.625	132-01042-68	1, 2, 3
TO-71/TO-78	6	.625	132-01042-68	1, 2, 3, 5, 6, 7

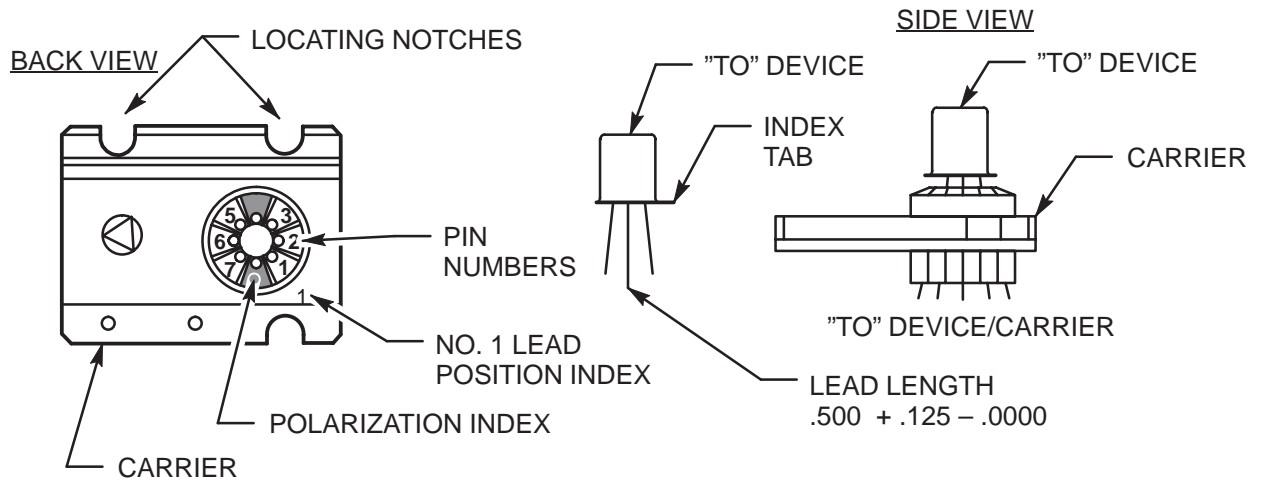


Figure 1. Unit Carrier for "TO" Device

P10161-001

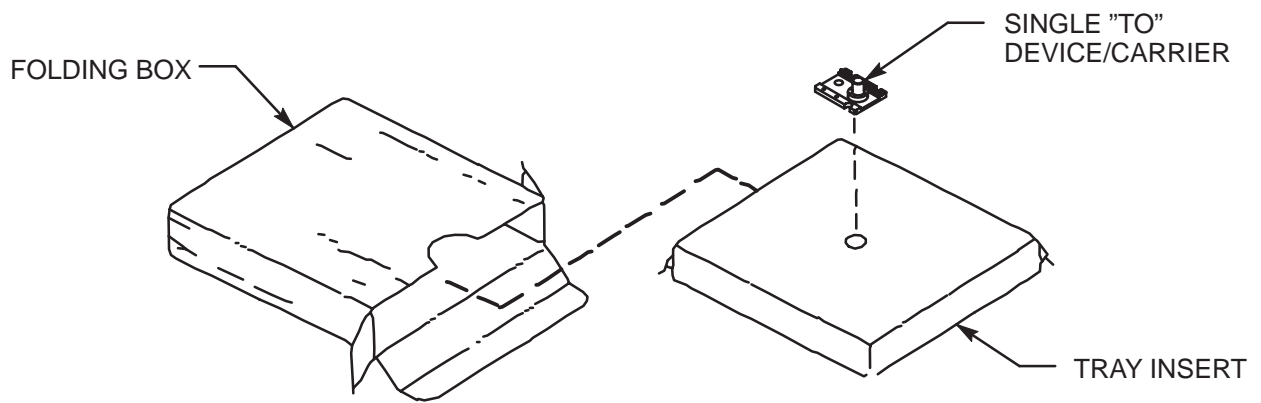


Figure 2. Unit Package for "TO" Devices (Example Only)

P10162-001

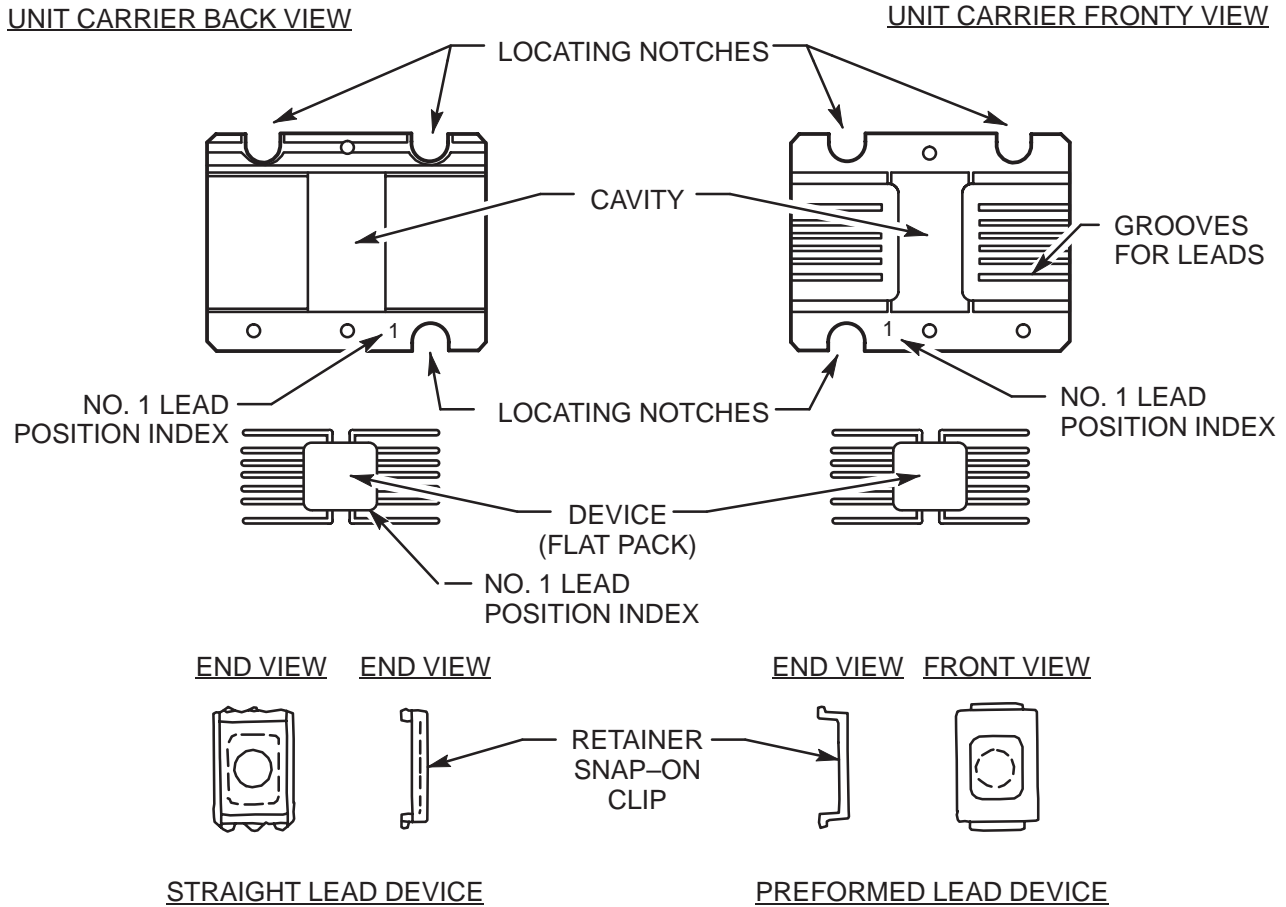


Figure 3. Unit Carrier Assembly for Straight/Preformed Lead Device

P10163-001

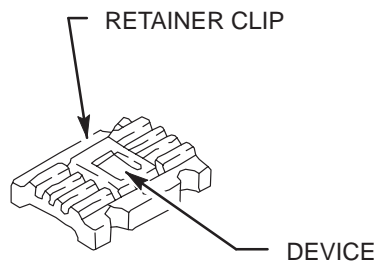


Figure 4. Device in Unit Carrier

P30029-001

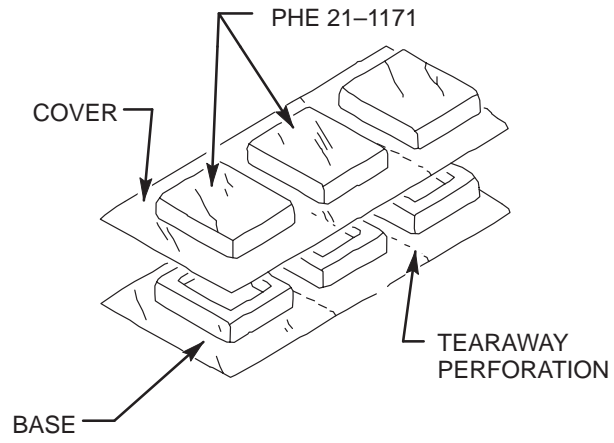


Figure 5. Plastic Unit Package for Flat Pack Devices (PHE 21-1171)