

SEMI G27-89

SPECIFICATION FOR LEADFRAMES FOR PLASTIC LEADED CHIP CARRIER (PLCC) PACKAGES

1 Preface

This specification is a guideline for high volume production of leadframes for plastic leaded chip carrier semiconductor packages. It is a design guideline for packaging engineers, leadframe stampers and mold manufacturers, and has been developed to meet the requirements of automatic assemblers.

2 Applicable Documents

2.1 *Order of Precedence* — To avoid conflicts, the order of precedence when ordering leadframes to this specification shall be as follows:

- Purchase Order
- This Specification
- Referenced Documents

2.2 SEMI Specifications

SEMI G4 — Specification for Integrated Circuit Leadframe Material

SEMI G10 — Standard Method of Mechanical Measurement for Leadframes

SEMI G18 — Specification, Integrated Circuit Leadframe Materials Used in the Production of Etched Leadframes

SEMI G21 — Specification, Plating Integrated Circuit Leadframes

2.3 Military and Federal Specifications¹

MIL-STD-105 — Sampling Procedures and Tables for Inspection by Attributes

MIL-STD-883 — Test Methods and Procedures for Microelectronics

2.4 ANSI Specification²

Y14.5M — Dimensioning and Tolerancing

2.5 JEDEC Publication³

Publication 9b — Registered and Standard Outlines for Semiconductor Devices

3 Selected Definitions

burr — a fragment of excess material either horizontal or vertical attached to the leadframe.

camber — curvature of the leadframe strip edge (see Figure 1).

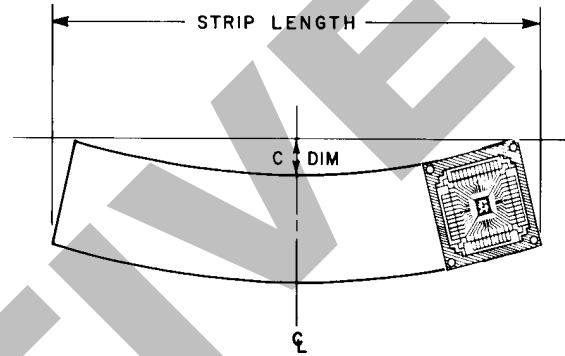


Figure 1
Camber

coil set — longitudinal bowing of the leadframe (see Figure 2).

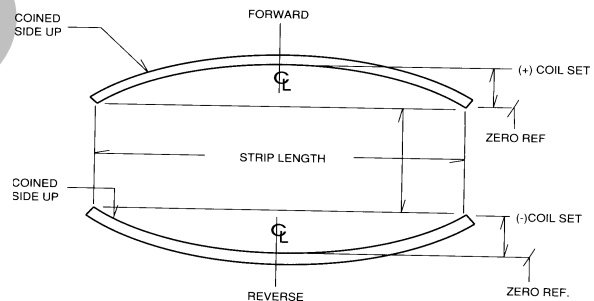


Figure 2
Coil Set

coined area — that area at the tip end of the bond fingers coined to produce a flattened area for functional use (see Figure 3).

¹ Military Standards, Naval Publications and Form Center, 5801 Tabor Avenue, Philadelphia, PA 19120

² ANSI, 1430 Broadway, New York, NY 10018

³ JEDEC, 20001 Eye Street N.W., Washington, D.C. 20006

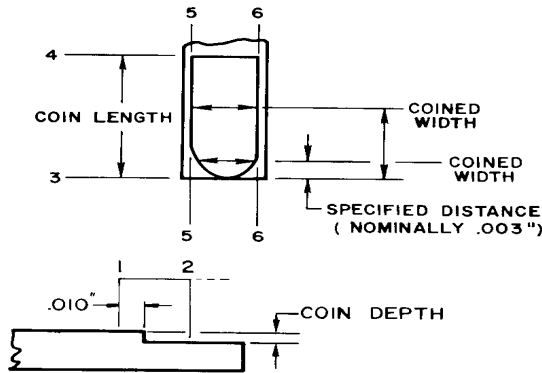


Figure 3
Coined Area

crossbow — transverse bowing of the leadframe (see Figure 4).

functional area — the die attach pad and the lead tips.

lead twist — angular rotation of bonding fingers (see Figure 5).

pits — shallow surface depression or craters in the leadframe material.

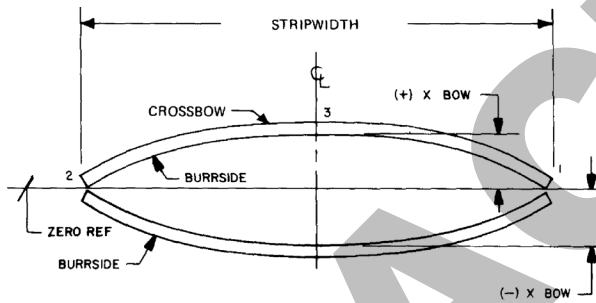


Figure 4
Crossbow



Figure 5
Lead Twist

slug marks — random dents in the leadframe caused by foreign material in the stamping die.

stamped leadframe terminology — (See Figure 6.)

true position circle — the circle with its center positioned at the center of the coined lead which defines the design position of the lead tip.

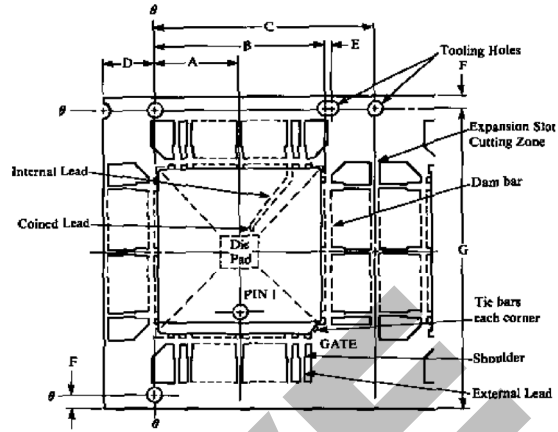


Figure 6
Plastic Leaded Chip Carrier Leadframe

4 Ordering Information

4.1 Purchase orders for leadframes furnished to this specification shall include the following information:

4.1.1 Current revision of the leadframe drawing detailing the base material and the plating type(s), thickness(es) and area(s).

4.1.2 Reference to this specification.

4.1.3 Vendor certification requirements.

5 Dimensions

See Table 1.

6 Defect Limits and Parameters

Note: Measurement methods are described in SEMI G10. Alternate methods may be used as agreed to between vendor and customer. The methods described in SEMI G10 are considered to be standard for the purpose of solving differences.

6.1 *Dimensional Tolerances* — See Figure 6.

6.2 *Minimum Flat Wire Bonding Area* — 80% of nominal lead width and 0.635 mm (0.025") in length.

6.3 *Coined Depth* — 0.013 mm (0.0005") min. to 30% of material thickness maximum.

6.4 *Horizontal Lead Spacing and Location (Lead Tips)*