

SEMI G19-0997 (Reapproved 0811) SPECIFICATION FOR DIP LEADFRAMES PRODUCED BY ETCHING

This Standard was technically approved by the Assembly & Packaging Global Technical Committee. This edition was approved for publication by the global Audits and Reviews Subcommittee on July 1, 2011. Available at www.semiviews.org and www.semi.org in August 2011; originally published in 1980; previously published September 1997.

NOTICE: The section symbol (§) is used to reference a numbered section, paragraph, or header and all subordinate paragraphs, headers, and embedded material (i.e., EXCEPTIONs, lists) therein. The paragraph symbol (§) is used to reference a particular numbered paragraph and embedded material therein. When duplicated (i.e., §§ and §§) the symbols are used to reference more than one section or paragraph, respectively.

NOTICE: Paragraphs entitled 'NOTE:' are not an official part of this Standard or Safety Guideline and are not intended to modify or supersede the official Standard or Safety Guideline. These have been supplied by the global technical committee to enhance the usage of the Standard or Safety Guideline.

NOTICE: This Document was reapproved with minor editorial changes.

NOTICE: This Standard or Safety Guideline has an Inactive Status because the conditions to maintain Current Status have not been met. Inactive Standards or Safety Guidelines are available from SEMI and continue to be valid for use.

1 Preface

1.1 This Specification is a guideline for production of DIP leadframes for plastic molded semiconductor packages produced by the etching process. It is a design guideline for packaging engineers, etchers, and mold manufacturers and has been developed to meet the requirements of automatic bonders.

NOTICE: SEMI Standards and Safety Guidelines do not purport to address all safety issues associated with their use. It is the responsibility of the users of the Documents to establish appropriate safety and health practices, and determine the applicability of regulatory or other limitations prior to use.

2 Referenced Standards and Documents

2.1 SEMI Standards and Safety Guidelines

SEMI G10 — Standard Method for Mechanical Measurement of Plastic Package Leadframes

SEMI G18 — Specification for Integrated Circuit Leadframe Material Used in the Production of Etched Leadframes

2.2 Other Documents

PCMI D-300 Specification

NOTICE: Unless otherwise indicated, all documents cited shall be the latest published versions.

3 Terminology

3.1 Definitions

3.1.1 *burrs and protrusions* — fragments of excess material, either horizontal or vertical, attached to the lead frame.

3.1.2 *camber* — curvature of the leadframe strip edge (refer to Figure 1).

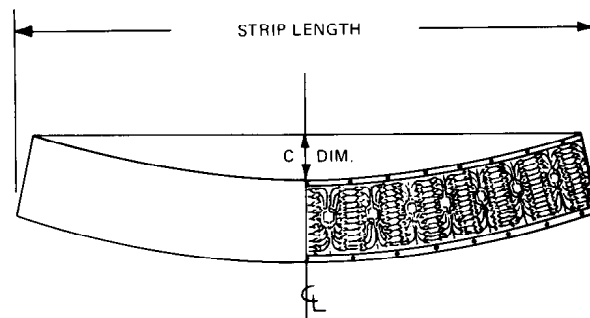


Figure 1
Camber

3.1.3 *coil set* — longitudinal bowing of the leadframe (refer to Figure 2).

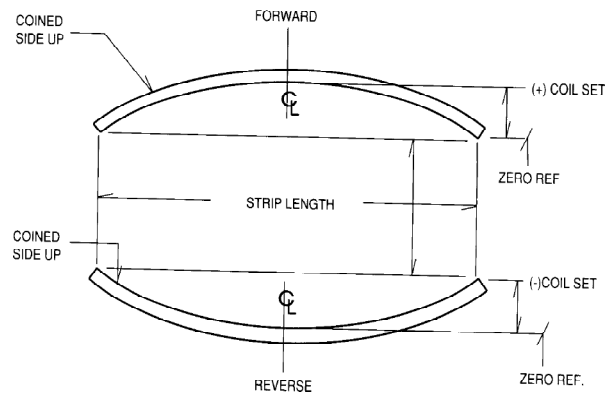
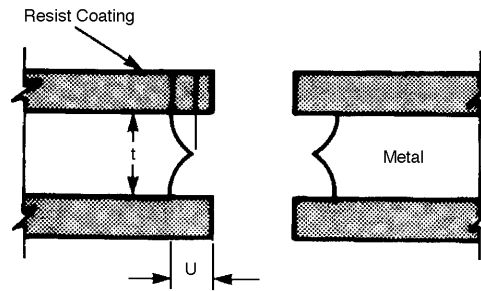


Figure 2
Coil Set

3.1.4 *compensation* — changes made in the dimensions on the master artwork other than those specified on the engineering artwork that allow for the process variables (i.e., etch factor, undercut).

3.1.5 *crossbow* — transverse bowing of the leadframe.

3.1.6 *etch factor* — the ratio of etched depth to the lateral etch or undercut (refer to Figure 3).



When: E = Etch Factor (Etching both sides)
 t = Metal Thickness
 U = Lateral Etch or Undercut
 Then: $E = \frac{.5 \times t}{U}$

Figure 3
Undercut and Etch Factor

3.1.7 *functional area* — the die attach pad and wire bond (lead tip) area.

3.1.8 *lateral etch or undercut* — the allowable bevelled edge caused by the leadframe etchant attacking the metal laterally as well as vertically (refer to Figure 4).

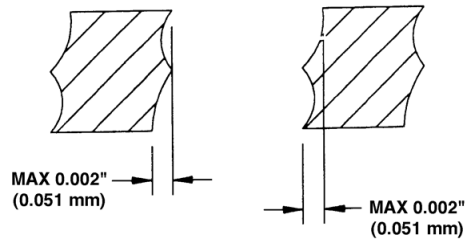


Figure 4
Overetching

3.1.9 *lead twist* — angular rotation of the bond fingers (refer to Figure 5).



Figure 5
Lead Twist