Australian Standard®

# Printed board assemblies

## Part 6: Surface mount land patterns

This Australian Standard was prepared by Committee TE/6, Printed Circuits. It was approved on behalf of the Council of Standards Australia on 2 November 1989 and published on 18 June 1990.

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The following interests are represented on Committee TE/6:

Australian Electrical and Electronic Manufacturers Association

Australian Tin Information Centre

Civil Aviation Authority

Confederation of Australian Industry

Department of Defence

Department of Industry Technology and Commerce

Institution of Radio and Electronics Engineers Australia

Telecom Australia

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# PREFACE

This draft Standard has been prepared by the Standards Australia Committee on Printed Circuits. It is based on ANSI/IPC-SM-782 prepared by the Institute for Interconnecting and Packaging Electronic Circuits. Grateful acknowledgement is given for the assistance received from this source.

The Standard will be published as Part of a series on Printed board assemblies presenting the technology on various aspects of PBAS. The committee believes that this technology is extremely important to the Industry at the present time because of the rapid change in availability of components. This situation is creating pressure for the adoption of surface mount techniques as a matter of urgency, hence the reliance on the IPC Standards which represent, what is seen as the most advanced information available at present.

Land patterns are defined in such a manner that they are transparent to the attachment process adopted for the assembly of the circuit. It is intended that the information given should be suitable for adoption for establishing a standard configuration for both manual designs and computer aided design systems. The land pattern and component dimensions are optimized to ensure proper joint and inspection criteria irrespective of whether components are mounted on one or both sides of the board and subjected to wave, reflow or another system of soldering. The tolerances associated with the standard dimensions are those normally associated with the printed board industry.

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STANDARDS AUSTRALIA

# Australian Standard

# Surface mount land patterns

## Part 6—Printed board assemblies

## SECTION 1. SCOPE AND GENERAL

**1.1 SCOPE.** This Standard provides guidance on land pattern geometries used for surface attachment of electronic components including the appropriate size, shape and tolerances to ensure sufficient area for the appropriate solder fillet and to allow for inspection and testing of solder joints.

Although land pattern geometries may be slightly different dependent on the soldering method used to attach the component, the information provided is intended to define a pattern in such a manner that it is independent of the process used. The information is intended to establish Standard configurations for both manual and computer aided design systems. Whether components are mounted on one or both sides of the board, subjected to wave, reflow or laser soldering, the pattern and component dimensions are optimized for proper solder joint and inspection criteria.

Although patterns are standardized they are subject to tolerances associated with plating, etching, masking, coating and cleaning depending on the quality and reliability requirements. In the event of conflict between the design requirements and the classes defined in this or other Standards, the design criteria shall take precedence and be reflected on the master drawing. Class definitions are useful for identifying the degree of precision required to meet performance requirements of a design rather than the reverse.

**1.2 APPLICATION.** In the event of conflict of design requirements between this Standard and other Standards on printed boards, the design criteria of this Standard shall take precedence.

**1.3 REFERENCED DOCUMENTS.** The following documents are referred to in this Standard:

AS

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|---|---|
| 2546 | Printed boards |
| 2546.0 | Part 0: Terms and definitions |
| 2546.1 | Part 1: General requirements and test methods |
| 2546.3 | Part 3: Design and use |
| 3508 | Printed board assemblies |
| 3508.1 | Part 1: Preparation, handling and assembly |
| 3508.3 | Part 3: Cleanliness |
| 3508.4 | Part 4: Acceptability of solder, printed board and solder joints—Pictorial presentation |
| 3508.5 | Part 5: Surface mount technology |

ANSI

| | |
|---|---|
| IPC-D-310B | Phototool generation and measurement techniques |
| IPC-R-700C | Suggested guidelines for modification, rework, and repair of printed boards and assemblies |

**1.4 TERMS AND DEFINITIONS.** For the purpose of this Standard, the definitions of AS 2546.0 and AS 3508.5 and those below apply.

**1.4.1 Phototool**—a general term applicable to any of the specifically defined photographic products; the artwork, artwork-master, working master and production master are each, individually, phototools.

**1.4.2 Phototooling**—generally applied to the entire group of photographic products used to prepare printed boards.

**1.5 DESIGN CLASSIFICATION.** Where appropriate, this Standard provides three design complexity categories—i.e. Classes A, B and C, applied to features, tolerances or measurements which reflect progressive increases in tooling, materials and processing and therefore, progressive increases in cost. *The use of one category for a specific feature does not mean that other features shall be of that same category.*

Selection of a particular category should be based on the minimum need, recognizing that precision performance and conductive pattern density determine design classification. In the event of conflict between the design requirements and the categories defined herein, the design requirements shall take precedence.

Design requirements determine the category to be used. Classification is useful for identifying degrees of precision required to meet design or performance requirements of structures and to establish and document communications between design, manufacture and other disciplines.

Classification of design complexity requirements should not be confused with the performance classification of item end-use to define the performance of a product. Some documents, e.g. MIL STDS, may refer to categories such as consumer, industrial, professional and high reliability equipment. The need to apply certain design concepts should depend on the complexity and precision required to produce a particular land pattern or structure. *Any design classification may be applied to any of the equipment categories mentioned.* See Clause 2.1.3 and Section 3, specifically Clause 3.5.4 and Tables 3.2 and 3.3.