



BSI Standards Publication

Circuit boards and circuit board assemblies — Design and use

Part 6-3: Land pattern design — Description of land pattern for through hole components (THT)

National foreword

This British Standard is the UK implementation of EN IEC 61188-6-3:2025. It is identical to IEC 61188-6-3:2024. It partially supersedes BS EN 61188-5-2:2003, BS EN 61188-5-3:2007, BS EN 61188-5-4:2007, BS EN 61188-5-5:2007, BS EN 61188-5-6:2003 and BS EN 61188-5-8:2008.

The UK participation in its preparation was entrusted to Technical Committee EPL/501, Electronic Assembly Technology.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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English Version

Circuit boards and circuit board assemblies - Design and use -
Part 6-3: Land pattern design - Description of land pattern for
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(IEC 61188-6-3:2024)

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Conception et utilisation - Partie 6-3: Conception de la zone
de report - Description de la zone de report pour les
composants à trous traversants (THT)
(IEC 61188-6-3:2024)

Leiterplatten und Flachbaugruppen - Konstruktion und
Anwendung - Teil 6-3: Anschlussflächengestaltung -
Beschreibung von Anschlussflächen für Komponenten der
Steckmontage (THT)
(IEC 61188-6-3:2024)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 91/1982/FDIS, future edition 1 of IEC 61188-6-3, prepared by TC 91 "Electronics assembly technology" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61188-6-3:2025.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2026-01-31 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2028-01-31 document have to be withdrawn

This document partially supersedes EN 61188-5-2:2003, EN 61188-5-3:2007, EN 61188-5-4:2007, EN 61188-5-5:2007, EN 61188-5-6:2003 and EN 61188-5-8:2008 and all of their amendments and corrigenda (if any).

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Endorsement notice

The text of the International Standard IEC 61188-6-3:2024 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standard indicated:

IEC 61188-6-2	NOTE	Approved as EN IEC 61188-6-2
IEC 61191-1	NOTE	Approved as EN IEC 61191-1
IEC 61191-2	NOTE	Approved as EN 61191-2
IEC 61191-3	NOTE	Approved as EN 61191-3
IEC 61191-4	NOTE	Approved as EN 61191-4

Annex ZA
(normative)

**Normative references to international publications
with their corresponding European publications**

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cencenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60194-2	-	Printed boards design, manufacture and assembly - Vocabulary - Part 2: Common usage in electronic technologies as well as printed board and electronic assembly technologies	-	-
IEC 60352-5	2020	Solderless connections - Part 5: Press-in connections - General requirements, test methods and practical guidance	EN IEC 60352-5	2020

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**CIRCUIT BOARDS AND CIRCUIT BOARD ASSEMBLIES –
DESIGN AND USE –****Part 6-3: Land pattern design –
Description of land pattern for through hole components (THT)**

FOREWORD

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IEC 61188-6-3 has been prepared by IEC technical committee 91: Electronics assembly technology. It is an International Standard.

This first edition partially cancels and replaces the IEC 61188-5 series of International Standards.

The significant technical changes with respect to the previous edition are listed in the Introduction and further detailed information and calculations can be found in Annex A.

The text of this International Standard is based on the following documents:

Draft	Report on voting
91/1982/FDIS	91/1997/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 61188 series, published under the general title *Circuit boards and circuit board assemblies – Design and use*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

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INTRODUCTION

The new series IEC 61188-6-xx replaces the below listed documents:

IEC 61188-5-1:2002, *Printed boards and printed board assemblies – Design and use – Part 5-1: Attachment (land/joint) considerations – Generic requirements*

IEC 61188-5-2:2003, *Printed boards and printed board assemblies – Design and use – Part 5-2: Attachment (land/joint) considerations – Discrete components*

IEC 61188-5-3:2007, *Printed boards and printed board assemblies – Design and use – Part 5-3: Attachment (land/joint) considerations – Components with gull-wing leads on two sides*

IEC 61188-5-4:2007, *Printed boards and printed board assemblies – Design and use – Part 5-4: Attachment (land/joint) considerations – Components with J leads on two sides*

IEC 61188-5-5:2007, *Printed boards and printed board assemblies – Design and use – Part 5-5: Attachment (land/joint) considerations – Components with gull-wing leads on four sides*

IEC 61188-5-6:2003, *Printed boards and printed board assemblies – Design and use – Part 5-6: Attachment (land/joint) considerations – Chip carriers with J-leads on four sides*

IEC 61188-5-8:2007, *Printed boards and printed board assemblies – Design and use – Part 5-8: Attachment (land/joint) considerations – Area array components (BGA, FBGA, CGA, LGA)*

The content of the above documents is based on IPC-SM-782 Rev. A with Amendments 1 and 2, which was replaced in 2002 by IPC-7351. The component spectrum and pitch levels have dramatically changed since publication of the 61188-5-xx series and its dimensioning concept no longer fulfils state of the art mounting and soldering requirements.

This document provides guidelines and focus on land pattern for through hole terminals (THT).

Within the previous standards, primarily the pin diameter of the component and the assembly tolerances were considered.

The new approach is that a sufficiently available (proportional) land pattern is related to:

- size and shape of the component terminal
- the requirements of the assembly process and its used tools
- technology, structure, thickness and manufacturing process of the circuit board

in order to achieve the best possible solder joint due to manufacturability, the assembly result and the reliability of an assembled circuit board.

The variety and the possibility of building printed circuit boards has grown considerably over the years. The technologies can become very complex. The proportion of copper in the circuit board is determined by the number of layers or copper thickness per layer. This could lead to higher thermal capacity of the circuit board.

The general use of soldered THT components has declined dramatically. The requirements for current carrying capacity (e.g. wire thickness of inductors) have increased for the through-hole components used. At the same time, the use of wave soldering has declined in favour of selective wave soldering or other technologies.

A balance between heat source (soldering process) and heat sink (component or component pin and circuit board) must be found for required assembly results. The landing surface must be defined according to these requirements.

Detailed information and calculations can be found in Annex A.