

© Copyright SEK. Reproduction in any form without permission is prohibited.

Mönsterkort – Beskrivning och överföring av datorlagrad information – Del 2-2: Fordringar för användning av data för tillverkning av mönsterkort

Printed board assembly products –

Manufacturing description data and transfer methodology –

Part 2-2: Sectional requirements for implementation of printed board fabrication data description

Som svensk standard gäller europastandarden EN 61182-2-2:2012. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61182-2-2:2012.

Nationellt förord

Europastandarden EN 61182-2-2:2012

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 61182-2-2, First edition, 2012 - Printed board assembly products - Manufacturing description data and transfer methodology - Part 2-2: Sectional requirements for implementation of printed board fabrication data description**

utarbetad inom International Electrotechnical Commission, IEC.

Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

SEK är Sveriges röst i standardiseringsarbetet inom elområdet

SEK Svensk Elstandard svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

Stora delar av arbetet sker internationellt

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

Var med och påverka!

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

SEK Svensk Elstandard

Box 1284
164 29 Kista
Tel 08-444 14 00
www.elstandard.se

**Printed board assembly products -
Manufacturing description data and transfer methodology -
Part 2-2: Sectional requirements for implementation
of printed board fabrication data description
(IEC 61182-2-2:2012)**

Produits pour cartes imprimées équipées -
Données descriptives de fabrication
et méthodologie de transfert -
Partie 2-2: Exigences intermédiaires pour
la mise en oeuvre de cartes imprimées -
Description des données de fabrication
(CEI 61182-2-2:2012)

Leiterplatten -
Beschreibung und Transfer von Daten -
Teil 2-2: Anforderungen für die
Anwendung von Dokumentationsdaten
der Leiterplattenfertigung
(IEC 61182-2-2:2012)

This European Standard was approved by CENELEC on 2012-06-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 91/1025/FDIS, future edition 1 of IEC 61182-2-2, prepared by IEC/TC 91 "Electronics assembly technology" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61182-2-2:2012.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2013-03-01
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2015-06-01

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 61182-2-2:2012 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 standards indicated:

IEC 61188-5-1	NOTE	Harmonised as EN 61188-5-1.
IEC 61188-5-2	NOTE	Harmonised as EN 61188-5-2.
IEC 61188-5-3	NOTE	Harmonised as EN 61188-5-3.
IEC 61188-5-4	NOTE	Harmonised as EN 61188-5-4.
IEC 61188-5-5	NOTE	Harmonised as EN 61188-5-5.
IEC 61188-5-6	NOTE	Harmonised as EN 61188-5-6.
IEC 61188-5-8	NOTE	Harmonised as EN 61188-5-8.
ISO 10303-210	NOTE	Harmonised as EN ISO 10303-210.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60194	-	Printed board design, manufacture and assembly - Terms and definitions	EN 60194	-
IEC 61182-2	-	Printed board assembly products - Manufacturing description data and transfer methodology - Part 2: Generic requirements	-	-

CONTENTS

1	Scope	6
2	Normative references	6
3	Terms and definitions	6
4	General principles	7
4.1	Requirements	7
4.2	Interpretation	7
4.3	Categories and content	8
5	General rules	9
5.1	Overview	9
5.2	File content descriptions	10
5.3	Logistic descriptions	10
5.4	File history descriptions	10
5.4.1	General	10
5.4.2	HistoryRecord use case – Initial design release	11
5.4.3	Supply chain modifications	12
5.4.4	OEM reviews modifications – HistoryRecord update	14
5.5	BOM (board fabrication materials)	14
5.6	AVL (board material suppliers)	16
5.7	Documentation layers	16
5.7.1	General	16
5.7.2	Documentation layer restrictions	16
5.7.3	Reference to documentation	17
5.7.4	Step usage	18
5.7.5	Set	19
5.8	Design for excellence (Dfx) analysis	19
5.8.1	General	19
5.8.2	DfxMeasurement	19
5.9	Miscellaneous image layers	19
5.9.1	General	19
5.9.2	Step usage	20
5.10	Packages and land patterns	20
5.10.1	General	20
5.10.2	Step usage for component packages and land patterns	20
5.10.3	Land pattern details	21
5.11	Solder mask and legend layers	21
5.11.1	General	21
5.11.2	Solder mask details	21
5.11.3	Legend details	21
5.11.4	Step usage for solder mask and legend layers	22
5.12	Drilling and routing (tooling) layers	22
5.12.1	General	22
5.12.2	Drilling details	22
5.12.3	Routing details	22
5.12.4	Step usage for drilling and routing	23
5.13	Net list	23

5.13.1	General	23
5.13.2	Step usage for net list.....	24
5.14	Outer conductive layers.....	24
5.14.1	General	24
5.14.2	Outer conductive layer details	24
5.14.3	Step usage for outer conductive layers	24
5.15	Inner conductive layers	25
5.15.1	Requirement.....	25
5.15.2	Inner conductive layer details	25
5.15.3	Step usage for inner conductive layers	25
5.16	Board construction	25
5.16.1	Requirement.....	25
5.16.2	Board construction details	26
5.16.3	Step usage for board construction	26
6	Modeling	26
6.1	General.....	26
6.2	Information models.....	27
7	Report generators	28
7.1	IEC 61182-2-2 format.....	28
7.2	Hole usage report.....	29
7.3	Pad usage report.....	29
7.4	Conductor usage report.....	29
8	Glossary.....	29
	Annex A (normative) Printed board fabrication schema	30
	Bibliography.....	42
	Figure 1 – Board fabrication data relationship	9
	Figure 2 – HistoryRecord use case	11
	Figure 3 – Documentation package grade requirements.....	18
	Figure 4 – Fabrication steps data model example	27
	Figure 5 – IPC-2584 UML data model	28
	Table 1 – Function relationship of an IEC 61182-2-2 fabrication file.....	8
	Table 2 – Bom restrictions	15
	Table 3 – Recommended reference designators for printed board material	15
	Table 4 – Avl restrictions	16
	Table 5 – Documentation layer restrictions	17
	Table 6 – General descriptions of documentation layer functions	17
	Table 7 – Relationship to documentation standard	18
	Table 8 – Miscellaneous layer restrictions.....	20

PRINTED BOARD ASSEMBLY PRODUCTS – MANUFACTURING DESCRIPTION DATA AND TRANSFER METHODOLOGY –

Part 2-2: Sectional requirements for implementation of printed board fabrication data description

1 Scope

This part of IEC 61182 provides the information on the manufacturing requirements used for fabricating printed boards. This standard determines the XML schema details, defined in the generic standard IEC 61182-2 and some of the sectional standards that are required to accomplish the focused tasks. When other standards are invoked, their requirements become a mandatory part of the fabrication details as defined in the IEC 61182-2.

The IEC 61182-2 contains all the requirements necessary to build an electronic product. The cardinality indicated in the IEC 61182-2 may be superseded by a restriction of an attribute (enumerated string ID) or indication of a requirement that is noted as being optional in the generic standard. However, this standard renders the requirement mandatory based on the supply chain communication need.

In order to assist the users of this standard, all the applicable XML schema elements that apply to the board fabrication function are listed in Annex A. The list is grouped by topics and shows the absolute path for the elements that pertain to the focus of this standard. If the parent element is not present no children are considered in the implementation either. However, all attributes identified for a particular element follow the cardinality of the IEC 61182-2, unless a restriction is stated in this standard.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60194, *Printed board design, manufacture and assembly – Terms and definitions*

IEC 61182-2, *Printed board assembly products – Manufacturing description data and transfer methodology – Part 2: Generic requirements*