IEC 62326-20

Edition 1.0 2016-02

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Printed boards –
Part 20: Printed circuit boards for high-brightness LEDs

Cartes imprimées –
Partie 20: Cartes de circuits imprimés destinées aux LED à haute luminosité

IEC 62326-20:2016-02(en-fr)

IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

About the IEC
The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications
The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

IEC Catalogue - webstore.iec.ch/catalogue
The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

IEC publications search - www.iec.ch/searchpub
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,…). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

Electropedia - www.electropedia.org
The world's leading online dictionary of electronic and electrical terms containing 20 000 terms and definitions in English and French, with equivalent terms in 15 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary
65 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

A propos de l'IEC
La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC
Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Catalogue IEC - webstore.iec.ch/catalogue
Application autonome pour consulter tous les renseignements bibliographiques sur les Normes internationales, Spécifications techniques, Rapports techniques et autres documents de l'IEC. Disponible pour PC, Mac OS, tablettes Android et iPad.

Recherche de publications IEC - www.iec.ch/searchpub
La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,…). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished
Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

Electropedia - www.electropedia.org
Le premier dictionnaire en ligne de termes électroniques et électriques. Il contient 20 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 15 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary
65 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

Service Clients - webstore.iec.ch/csc
Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: csc@iec.ch.

IEC 62326-20

Edition 1.0 2016-02

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Printed boards – Part 20: Printed circuit boards for high-brightness LEDs

Cartes imprimées – Partie 20: Cartes de circuits imprimés destinées aux LED à haute luminosité

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 31.180

ISBN 978-2-8322-3152-4

Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

____

PRINTED BOARDS –

Part 20: Printed circuit boards for high-brightness LEDs

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62326-20 has been prepared by IEC technical committee 91: Electronics assembly technology.

This first edition cancels and replaces the IEC/PAS 62326-20 published in 2011, and constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) this edition focuses on the technical content of the printed circuit board for high-brightness LEDs;
b) the figures related to the printed circuit board for high-brightness LEDs have been refined.

The text of this standard is based on the following documents:

FDIS	Report on voting
91/1311/FDIS	91/1330/RVD

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

A list of all parts in the IEC 62326 series, published under the general title *Printed boards*, can be found on the IEC website.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

PRINTED BOARDS –

Part 20: Printed circuit boards for high-brightness LEDs

1 Scope

This part of IEC 62326 specifies the properties of the printed circuit board (hereafter described as PCB) for high-brightness LEDs. Many aspects of the PCB for high-brightness LEDs are identical with those of ordinary PCBs, therefore, some aspects of this standard also describe general aspects.

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 61189-3:2007, *Test methods for electrical materials, printed boards and other interconnection structures and assemblies – Part 3: Test methods for interconnection structures (printed boards)*

IEC 61249-2-6, *Materials for printed boards and other interconnecting structures – Part 2-6: Reinforced base materials, clad and unclad – Brominated epoxide non-woven/woven E-glass reinforced laminated sheets of defined flammability (vertical burning test), copper-clad*

IEC 61249-2-7, *Materials for printed boards and other interconnecting structures – Part 2-7: Reinforced base materials clad and unclad – Epoxide woven E-glass laminated sheet of defined flammability (vertical burning test), copper-clad*

IEC 62878-1-1, *Device embedded substrate – Part 1-1: Generic specification – Test methods*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60194 apply.

3.2 Abbreviations

AABUS As Agreed Between User amd Supplier
BGA Ball Grid Array
CCL Copper Clad Laminate
COB Chip On Board
CSP Chip size package
HID High Intensity Discharge
LED Light Emitting Diode
PCB Printed Circuit Board

PWB Printed Wiring Board

4 Classification and class of the printed circuit board for high-brightness LEDs

The PCB for high-brightness LEDs specified in this standard shall satisfy the specifications A to C in Table 1 and Figure 1 in the following way. The materials used in the materials of PWB are not specified, however, they shall be agreed between user and supplier (hereafter referred to as AABUS) depending on the application area of the boards in question. Figure 1 gives an example of classification and their application by base materials, for printed circuit boards for high-brightness LEDs and final products.

Table 1 – Application and classification

Primary classification (thermal conductivity)	Definition	Secondary classification (insulation property)	Definition	Thermal conductivity parameter W/(mK)	Heat transfer parameter W/(m^{2}K)	Thermal impedance (Km^2/W)
A	Standard boards	I	No specification	<1	<10	Thermal impedance can be calculated from the measurement of thermal conductivity and the inverse heat transfer parameter.
		II	Electric strength <1 000 V			
		III	Electric strength ≥1 000 V			
B	Thermal conductive boards	I	No specification	≥1	<10	
		II	Electric strength <1,000 V			
		III	Electric strength ≥1 000 V			
C	High thermal conductive boards	I	No specification	≥1	≥10	
		II	Electric strength <1 000 V			
		III	Electric strength ≥1 000 V			

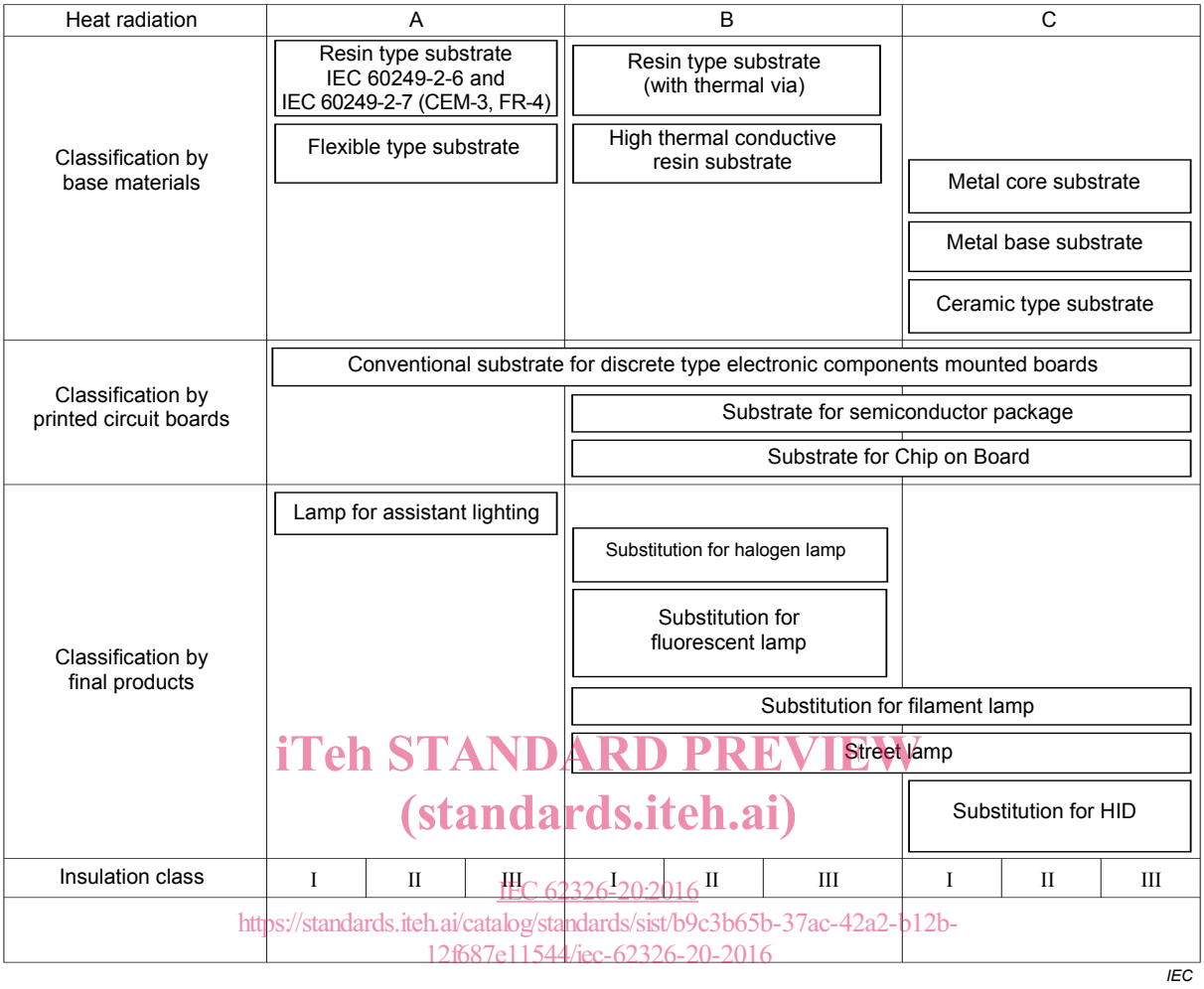


Figure 1 – Example of a classification and its application

5 Design rules and allowance

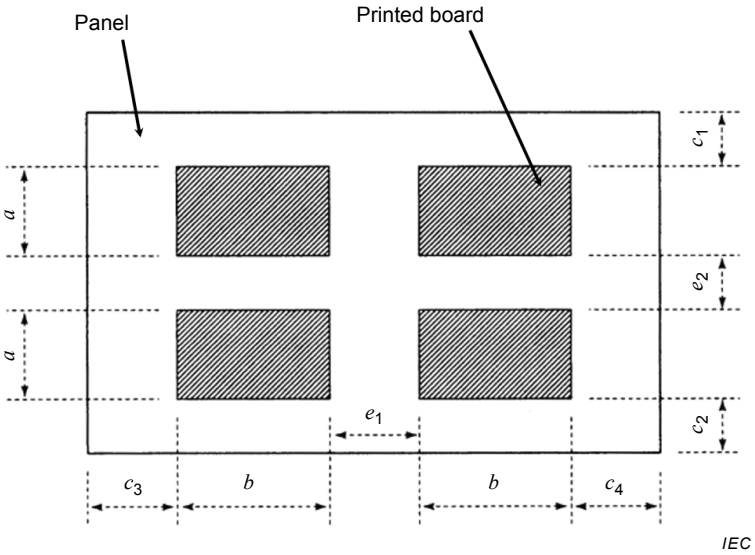
5.1 Panel and board sizes

5.1.1 Board size

NOTE Indications on board size are added for reference only.

The size of the board of the product ($a \times b$) illustrated in Figure 2.

should be selected so that the boards can be arranged efficiently within a panel with a size as specified in Table 2. These dimensions are given for information only. Or, a proper panel with a size given in Table 2 shall be selected so as to satisfy the required efficient arrangement of the boards.



Key

Board size of the product: $a \times b$

Space between board and panel edges: c_1, c_2, c_3, c_4

Space between boards: e_1, e_2

Figure 2 – Board arrangement in a panel

Table 2 – Panel dimensions

Size of a CCL panel	Division			
	4	6	8	9
1 000 × 1 000	500 × 500	333 × 500	250 × 500	333 × 333
1 000 × 1 200	500 × 600	333 × 600 400 × 500	300 × 500	333 × 400
Dimensions are in millimetres.				

5.1.2 Allowance of dimensions

The allowance of dimensions of a board or a panel is given in Table 3.

Table 3 – Allowance of dimensions

Length mm	Allowance
≤100	±0,2 mm
>100	Add 0,1 mm for each 50 mm exceeding a length of 100 mm.

5.1.3 Perforation and slit

The perforation and slits are shown in Figure 3. The allowances of the distances from the datum point to the center of the cut of the perforation and slit is given in Table 4.

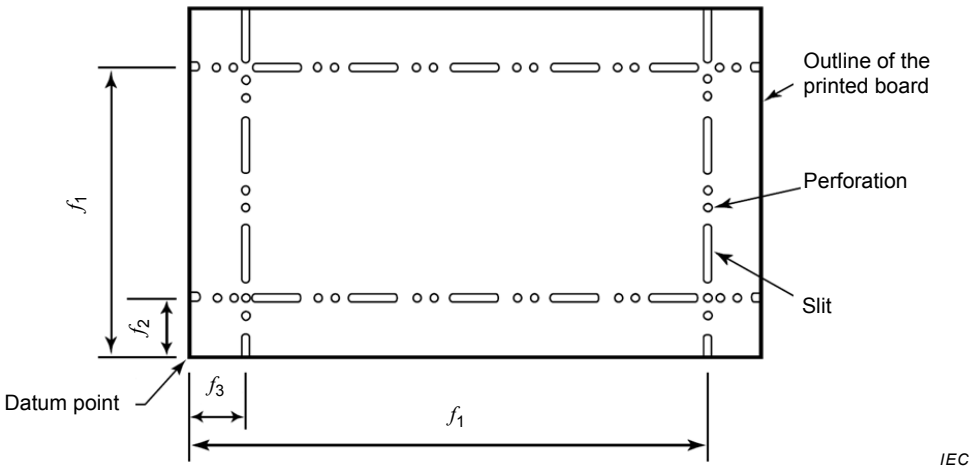


Figure 3 – Distances from the datum point to perforation and slit

Table 4 – Allowance of the distances from the datum point to perforation and slit

Distances from the datum point to perforation and slit mm	Allowance
≤100	±0,2 mm
>100	Add 0,1 mm for each 50 mm beyond a length of 100 mm.

5.1.4 V-cut

The V-cut is shown in Figure 4 and Figure 5. The allowance of the distance from the reference datum to the center of the V-cut (g_1 to g_4) is given in Table 5. The allowance of the deviation of the position of the V-cut on the front and back planes is 0,2 mm, and the allowance of the uncut thickness of the board is the sum of the allowance of the board thickness ±0,1 mm.

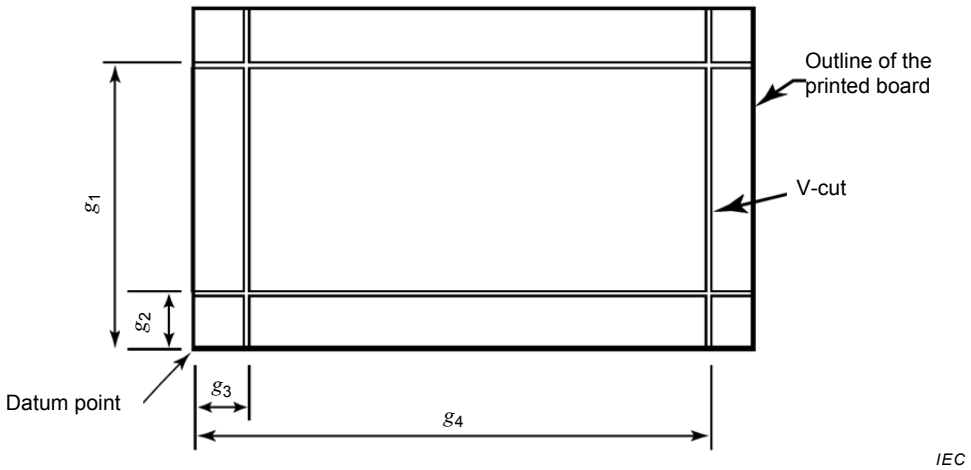


Figure 4 – Distance from the datum point to the V-cut

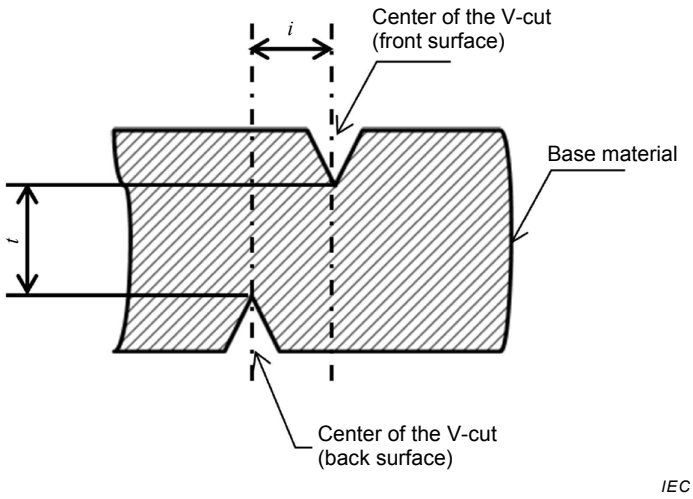


Figure 5 – Allowance of position off-set of V-cuts on front and back surfaces

Table 5 – Allowance of the distance from the datum point to the center of the V-cut

Distance from the datum point to the center of the V-cut mm	Allowance
≤100	±0,2 mm
>100	Add 0,1 mm for each 50 mm exceeding a length over 100 mm

5.2 Total board thickness

The allowance of the total board thickness (t) and symbol marks as shown in Figure 6 is given in Table 6.

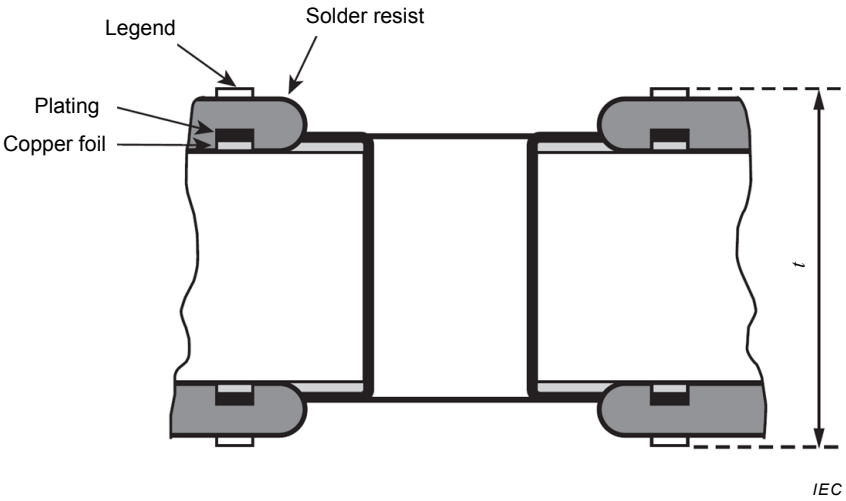


Figure 6 – PWB board with symbol mark, solder resist, copper foil and plating