IEC 62326-20

Edition 1.0 2016-02

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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 Ed. 1.0 - Preview only Copy via ILNAS e-Shop

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

THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2016 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

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 Ed. 1.0 - Preview only Copy via ILNAS e-Shop

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 Ed. 1.0 - Preview only Copy via ILNAS e-Shop

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.

® Registered trademark of the International Electrotechnical Commission
Marque déposée de la Commission Electrotechnique Internationale

CONTENTS

FOREWORD......6
1 Scope......8
2 Normative references......8
3 Terms, definitions and abbreviations......8
  3.1 Terms and definitions......8
  3.2 Abbreviations......8
4 Classification and class of the printed circuit board for high-brightness LEDs......9
5 Design rules and allowance......10
  5.1 Panel and board sizes......10
    5.1.1 Board size......10
    5.1.2 Allowance of dimensions......11
    5.1.3 Perforation and slit......11
    5.1.4 V-cut......12
  5.2 Total board thickness......13
  5.3 Holes......14
    5.3.1 Insertion holes and vias......14
    5.3.2 Datum hole......16
    5.3.3 Assembly hole (a through-hole without wall plating)......16
  5.4 Conductor......17
    5.4.1 Width of conductor pattern and its allowance......17
    5.4.2 Distance between conductors and its allowance......17
    5.4.3 Thickness of the insulating layer......18
  5.5 Printed contact......18
    5.5.1 Allowance of the distance between the centers of two adjacent printed contacts......18
    5.5.2 Allowance of the terminal width of printed contacts......19
    5.5.3 Shift of the center of printed contacts on front and back sides of a board......19
  5.6 Land pattern......20
    5.6.1 Allowance of the distance between the centers of two lands......20
    5.6.2 Allowance of the width of a land......20
    5.6.3 Land diameter and its allowance for BGA/CSP......21
  5.7 Fiducial mark and mark for component positioning......22
    5.7.1 Typical form and size of the fiducial mark......22
    5.7.2 Dimensional allowance of fiducial mark and component positioning mark......23
    5.7.3 Position allowance of the component positioning mark......23
  5.8 Interlayer connection – Copper plating......23
6 Quality......24
  6.1 Gap between conductor and the wall of a component insertion hole or a via......24
  6.2 Positional deviation between conductor layers of a multilayer board......24
  6.3 Minimum land width......24
  6.4 Surface treatment......25
    6.4.1 Gold plating for printed contact......25
    6.4.2 Other surface treatment......26
  6.5 Defects of solder resist......26
  6.6 Symbol mark......28
    6.6.1 General......28

IEC 62326-20 Ed. 1.0 - Preview only Copy via ILNAS e-Shop

6.6.2 Conductor surface 28
6.6.3 Between conductors 28
6.6.4 Defects within insulating layers 29
6.6.5 Routing and drilling 30
6.6.6 Conductor pattern 30
6.7 Land 30
6.8 Land of a land pattern 31
6.9 Defects in a land for BGA/CSP mounting 32
6.10 Printed contact 32
7 Performance and test methods 34
7.1 Resistance of conductors 34
7.2 Current proof of conductor and plated through hole 35
7.3 Observation of component mountings and vias 36
7.3.1 Observation with standard conditions 36
7.3.2 Observation after thermal shock test 38
8 Marking, packaging and storage 39
8.1 Marking on a product 39
8.2 Marking on the package 39
8.3 Packaging and storage 40
8.3.1 Packaging 40
8.3.2 Storage 40
Annex A (informative) Classification and class of the PCB for high-brightness LEDs 41
Bibliography 46

Figure 1 – Example of a classification and its application 10
Figure 2 – Board arrangement in a panel 11
Figure 3 – Distances from the datum point to perforation and slit 12
Figure 4 – Distance from the datum point to the V-cut 12
Figure 5 – Allowance of position off-set of V-cuts on front and back surfaces 13
Figure 6 – PWB board with symbol mark, solder resist, copper foil and plating 13
Figure 7 – Positions of component insertion holes 15
Figure 8 – Distance between the wall of a hole and the board edge 15
Figure 9 – Wall of a hole and the minimum designed spacing to the inner conductor 16
Figure 10 – Width of finished conductor 17
Figure 11 – Distance between conductor and board edge 18
Figure 12 – Thickness of the insulating layer 18
Figure 13 – Distance between centers of terminals of printed contacts 19
Figure 14 – Terminal width of a printed contact 19
Figure 15 – Shift of the center of printed contacts on front and back sides of a board 20
Figure 16 – Land pattern 20
Figure 17 – Land width of a land pattern 21
Figure 18 – Land diameter of BGA/CSP formed of a conductor only 21
Figure 19 – Land diameter (d) of BGA/CSP formed at the opening of solder resist 22
Figure 20 – Examples of fiducial mark and component positioning mark 23
Figure 21 – Minimum land width 25

IEC 62326-20 Ed. 1.0 - Preview only Copy via ILNAS e-Shop

Figure 22 – Exposure of conductor 26
Figure 23 – Minimum land with caused by the shift of solder resist 27
Figure 24 – Overlap, smear and shift of solder resist 27
Figure 25 – Examples of smear or blur 28
Figure 26 – Example of measling 29
Figure 27 – Examples of crazing 29
Figure 28 – Conductor nicks 30
Figure 29 – Conductor residue 30
Figure 30 – Land 31
Figure 31 – Defects in a land of a land pattern 31
Figure 32 – Defects in BGA/CSP mounting lands 32
Figure 33 – Areas to be checked for defects of a printed contact 33
Figure 34 – Defects in a printed contact 33
Figure 35 – Relations between resistance and width, thickness and temperature of a conductor 35
Figure 36 – Relationship between current, conductor width and thickness and temperature rise 36
Figure 37 – Defect on a plating of a component hole 37
Figure 38 – Resin smear 38
Figure 39 – Corner crack 38
Figure 40 – Barrel crack 39
Figure 41 – Foil crack 39
Figure A.1 – Relation between thermal conductive parameter and heat transfer coefficient parameter 42

Table 1 – Application and classification 9
Table 2 – Panel dimensions 11
Table 3 – Allowance of dimensions 11
Table 4 – Allowance of the distances from the datum point to perforation and slit 12
Table 5 – Allowance of the distance from the datum point to the center of the V-cut 13
Table 6 – Total thickness and its allowance 14
Table 7 – Allowance of holes for component insertion 14
Table 8 – Position allowance of component insertion holes 15
Table 9 – Distance between the wall of a hole and board edge 16
Table 10 – Minimum clearance between the wall of a hole and the inner layer conductor 16
Table 11 – Allowance of conductor width 17
Table 12 – Allowance of the distance between conductors 18
Table 13 – Allowance of terminal width of a printed contact 19
Table 14 – Allowance of terminal width of a printed contact 20
Table 15 – Allowance of the width of a land of a land pattern 21
Table 16 – Land diameter and its allowance for BGA/CSP 22
Table 17 – Allowance of the land diameter (d) of BGA/CSP formed at the opening of solder resist 22

IEC 62326-20 Ed. 1.0 - Preview only Copy via ILNAS e-Shop

Table 18 – Shapes and sizes of typical fiducial marks and component positioning marks 23
Table 19 – Minimum thickness of copper plating 23
Table 20 – Minimum thickness of copper plating 24
Table 21 – Minimum land width 27
Table 22 – Overlap, smear and shift of solder resist over a fool print....28
Table 23 – Allowance of the area of a defect, remaining width and protrusion of a land 31
Table 24 – Defect of a land of a land pattern 32
Table 25 – Defects in BGA/CSP mounting lands 32
Table 26 – Defects in a printed contact 34
Table 27 – Specification and test methods of resistance of conductors....34
Table 28 – Specification and test methods of current proof 35
Table 29 – Allowance in horizontal sectioning....38
Table A.1 – Relation between thermal conductive parameter and heat transfer coefficient parameter 42
Table A.2 – Related test methods....43

IEC 62326-20 Ed. 1.0 - Preview only Copy via ILNAS e-Shop