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Printed boards – **STANDARD PREVIEW**
Part 20: Printed circuit boards for high-brightness LEDs
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Cartes imprimées –
Partie 20: Cartes de circuits imprimés destinées aux LED à haute luminosité
IEC 62326-20:2016
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PRINTED BOARDS –

Part 20: Printed circuit boards for high-brightness LEDs

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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

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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 and 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/(m²K)	Thermal impedance (Km²/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			

Heat radiation	A			B			C		
Classification by base materials	Resin type substrate IEC 60249-2-6 and IEC 60249-2-7 (CEM-3, FR-4)			Resin type substrate (with thermal via)			Metal core substrate Metal base substrate Ceramic type substrate		
	Flexible type substrate			High thermal conductive resin substrate					
Classification by printed circuit boards	Conventional substrate for discrete type electronic components mounted boards								
				Substrate for semiconductor package					
				Substrate for Chip on Board					
Classification by final products	Lamp for assistant lighting						Substitution for halogen lamp Substitution for fluorescent lamp Substitution for filament lamp Street lamp Substitution for HID		
				Substitution for halogen lamp					
				Substitution for fluorescent lamp					
				Substitution for filament lamp					
				Street lamp					
Insulation class	I	II	III	I	II	III	I	II	III

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Figure 1 – Example of a classification and its application

5 Design rules and allowance

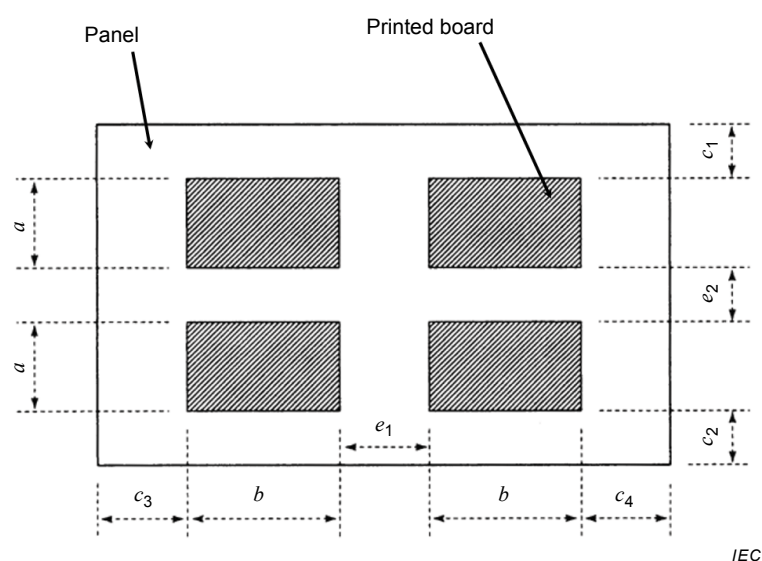
5.1 Panel and board sizes

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.



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KeyBoard 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	IEC 62326-20:2016 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.

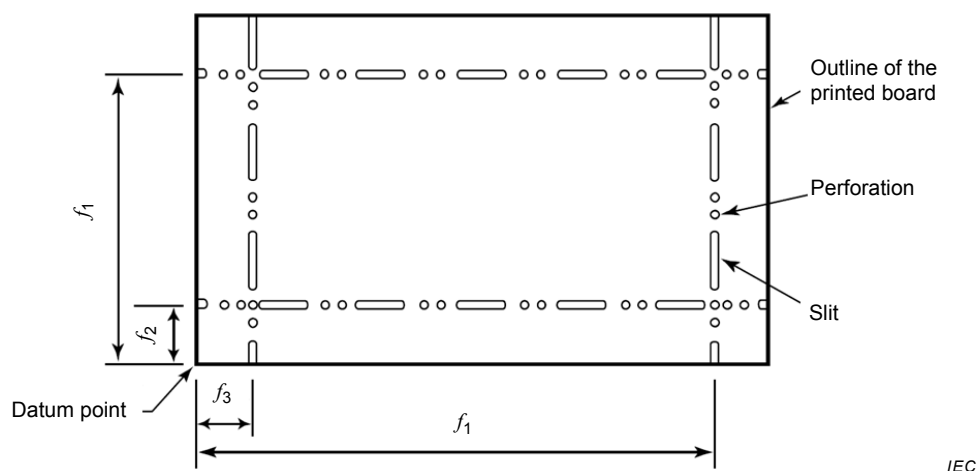


Figure 3 – Distances from the datum point to perforation and slit

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	$\pm 0,2$ mm
> 100	Add 0,1 mm for each 50 mm beyond a length of 100 mm.

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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 $\pm 0,1$ mm.

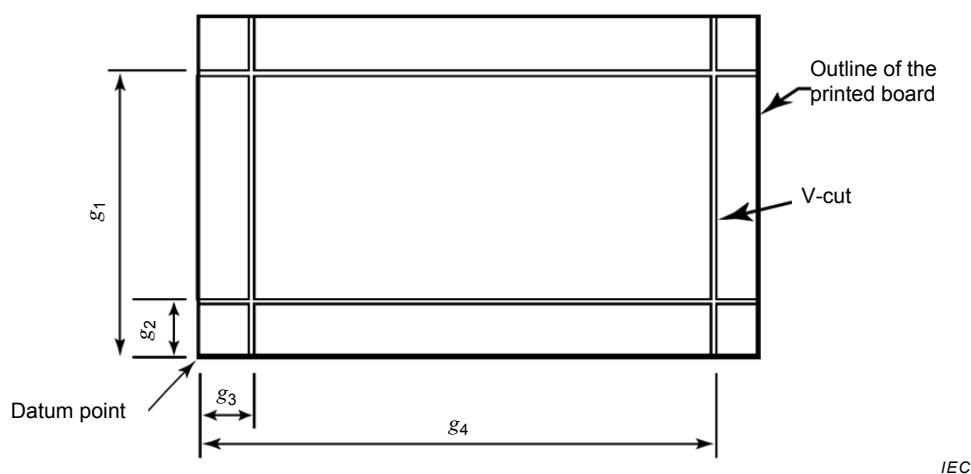
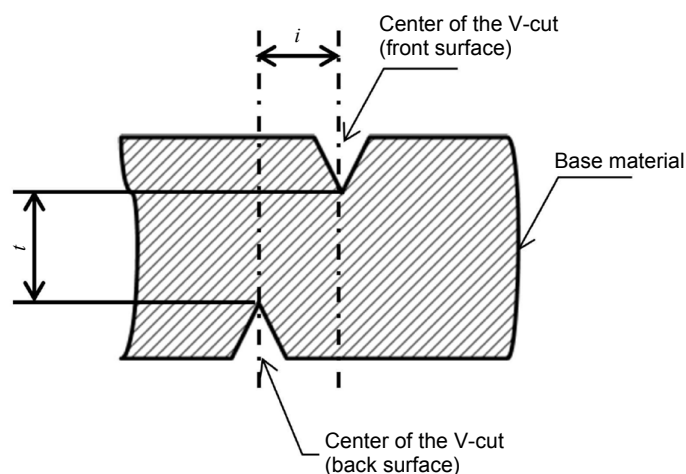


Figure 4 – Distance from the datum point to the V-cut



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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

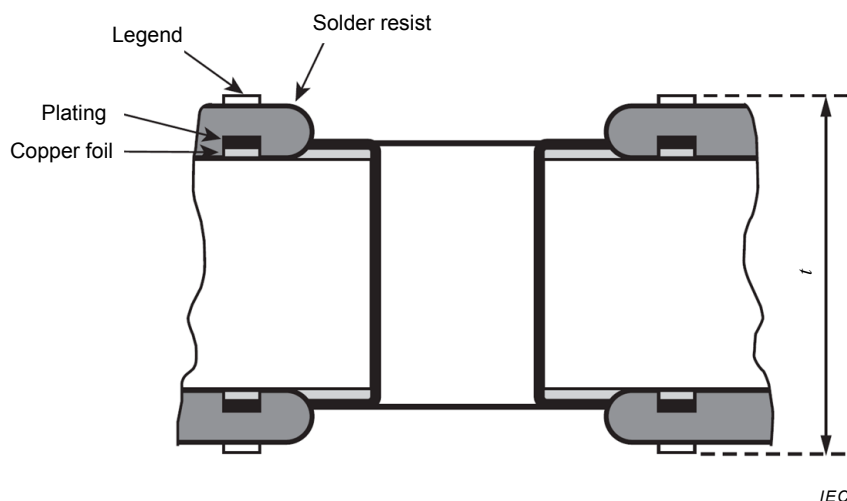
Distance from the datum point to the center of the V-cut mm	Allowance
≤ 100	$\pm 0,2$ mm
> 100	Add 0,1 mm for each 50 mm exceeding a length over 100 mm

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5.2 Total board thickness

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



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