IEC/PAS 62326-20

Edition 1.0 2011-01

PUBLICLY AVAILABLE SPECIFICATION

PRE-STANDARD

colour inside

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

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FOREWORD

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It is based on JPCA-TMC-LED01S-2010. It is published as a double-logo PAS and JPCA.

The text of this PAS is based on the following document:	This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document
Draft PAS	**Report on voting**
91/926/PAS	91/942A/RVD

Following publication of this PAS, which is a pre-standard publication, the technical committee or subcommittee concerned may transform it into an International Standard.

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PRINTED BOARDS –

Part 20: Electronic circuit board for high-brightness LEDs

1 Scope

This PAS specifies the properties of the electronic circuit board for high-brightness LEDs (hereafter described as “ECB”).

NOTE Standards relevant to the present standards are given below.

JPCA-TD01 Terms and definitions for printed circuits

JIS C 5603 Terms and definitions for printed circuits

2 Terms and definitions

For the purpose of this document, the terms used in this PAS shall be in accordance with JPCA-TD01 and JIS C 5603, unless otherwise specified.

3 Classification and class of the ECB

The ECB specified in this PAS shall satisfy the specification of (A) to (C) in Table 1 in the following way. The materials used in the materials of PWB are not specified; however, they shall be agreed upon between user and supplier depending on the application area of the boards in question.

Table 1 – Application and classification

Classification (thermal conductivity)	Definition	Small classification (insulation property)	Definition	Thermal conductivity parameter W/(mK)	Heat transfer parameter W/(m^{2}K)
A	Standard boards	Ⅰ	No specification	<1	<10
		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
Classsification by base materials	Resin type substrate (CEM-3, FR-4, FR-5) Flexible type substrate	Resin type substrate (with thermal via) High thermal conductive resin substrate	Metal core substrate Metal base substrate Ceramic type substrate
Classification by electronic circuit boards	Conventional substrate for discreat type electronic parts mounted boards	Substrate for semiconductor package Substrate for Chip on Board	
Classification by final products	Assistant lighting lamp	Lamp substitute for halogen lamp amp substitute for fluorescent lamp substitutio Lamp substitute for filament lamp Street lamp	Lamp substitute for HID
Insulation class	I II III	I II III	I II III

Figure 1 – Example of classification and their application by base materials, electronic circuit boards and final products

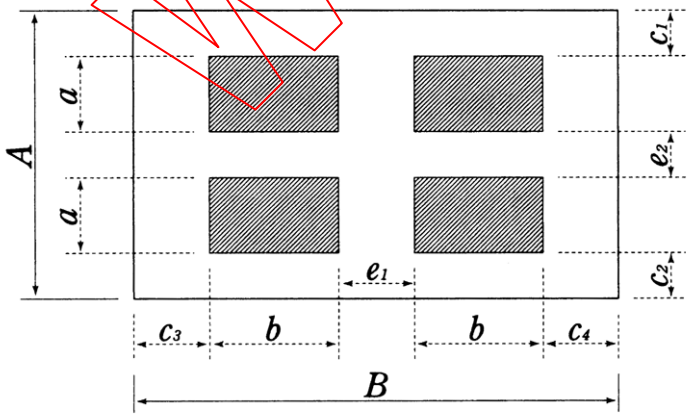
4 Design rules and allowance

4.1 Panel and board sizes

4.1.1 Board size (for reference only)

The size of the board of the product (axb) illustrated in Figure 2 shall be selected so that the boards can be arranged efficiently within a panel with a size specified in Table 2. Or, a proper panel with a size given in the table shall be selected so as to satisfy the required efficient arrangement of the boards.

Table 1. PWB



Board size of the product: a x 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 (informative purpose)

mm

Size of CCL (copper clad laminate) 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

4.1.2 Allowance of dimensions

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

Table 3– Allowance of dimensions

mm

Longitudinal size	Allowance
≤ 100	±0,2
100<	Add 0,1 for each 50 exceeding a length of 100.

4.1.3 Perforation and slit

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

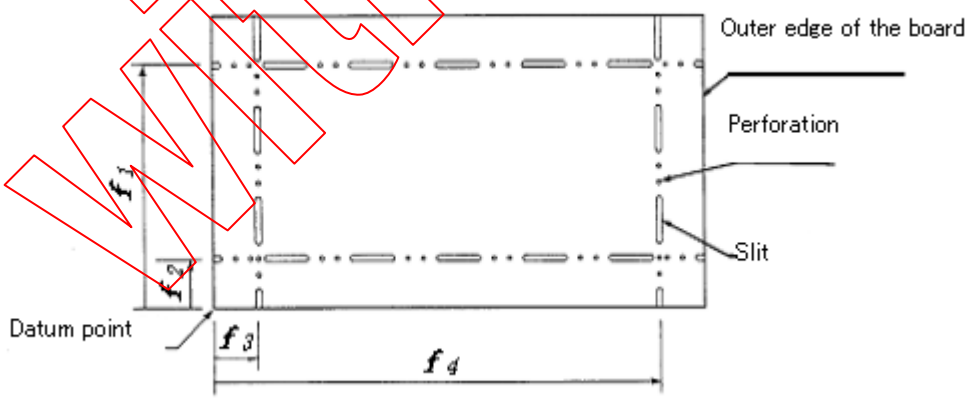


Figure 3 – Distances from the datum point to perforation and slit

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

mm

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

4.1.4 V-cut

The V-cut is shown in Figure 4. The allowance of the distance from the reference datum to the center of cut of the V (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.

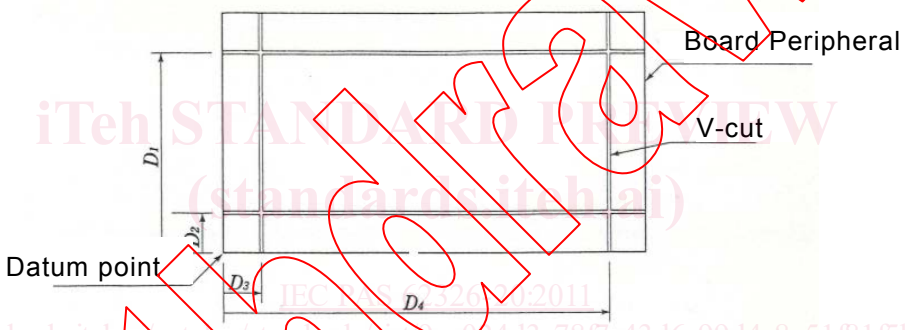


Figure 4 – Distance from the datum point to V-cut

mm

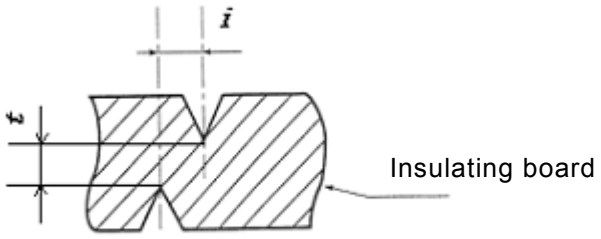


Figure 5 – Allowance of position off-set of V-cuts on front and back surfaces

Table 5 – Allowance for 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	Allowance
≤100	±0,2
>100	Add 0,1 for each 50 mm exceeding a length over 100 mm

4.2 Total board thickness

4.2.1 Total board thickness and its allowance

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

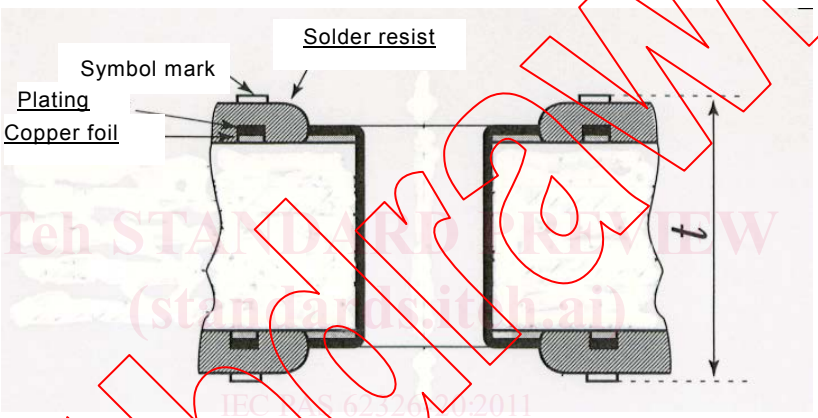


Figure 6 – PWB board with symbol mark, solder resist, copper foil and plating

Table 6 – Total thickness and its allowance

mm

Total thickness (center value of the final board) mm	**Allowance**
≤ 0,3 to < 0,5	+ 0,10 - 0,05
≤ 0,5 to < 0,8	±0,10
≤ 0,8 to < 1,10	±0,15
≤ 1,10 to < 1,40	±0,17
≤ 1,40 to < 2,00	±0,19
≤ 2,00	±10 %

4.3 Holes

4.3.1 Insertion holes and vias

(1) Allowance of component insertion holes

Allowance of component insertion holes is given in Table 7. The allowance given in this table is not applicable to vias (through-hole vias, buried vias and blind vias). The allowance of through-holes with a diameter less than 0,6 mm for insertion of a component and holes for press-fit of a component is to be agreed between user and supplier.

Table 7 – Allowance of holes for component insertion

mm

Item		Allowance
Plated through-hole	0,6 ≤ <2,0	±0,10
	2,0 ≤	±0,15
Non-plated through-hole		±0,10

(2) Position of a hole for component insertion

The center of a hole for component insertion should be at the cross point of the grid for pattern design including the complementary grid lines used. The allowance of a component insertion hole position, ($|\vec{i}, j|$), the deviation from the designed position in respect to the datum point as shown in Figure 7 is given in Table 8.

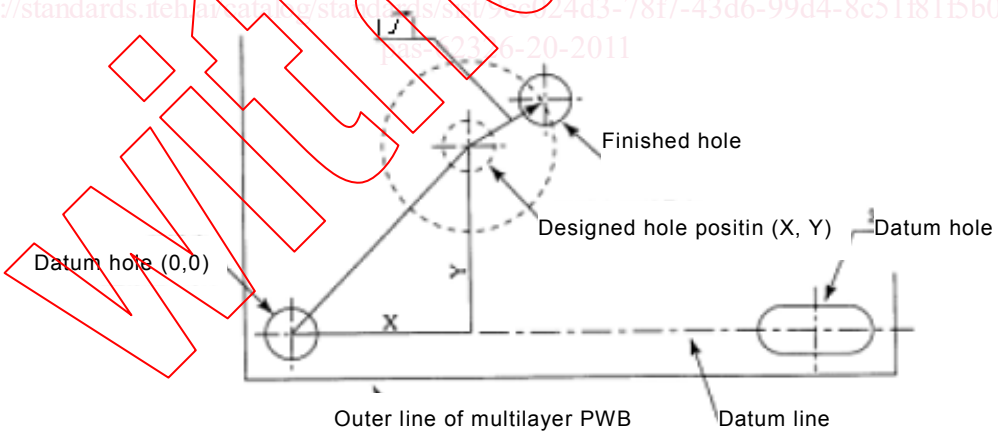


Figure 7 – Positions of component insertion holes

Table 8 – Position allowance of component insertion holes

mm

Longer dimension of rectangular board	Allowance
≤ 400	0,10
400<	For board exceeding 400, add 0,05 for each additional 100