

SEMI D36-0306

TERMINOLOGY FOR LCD BACKLIGHT UNIT

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NOTICE: This Document was completely rewritten in 2006.

NOTICE: This Standard or Safety Guideline has an Inactive Status because the conditions to maintain Current Status have not been met. Inactive Standards or Safety Guidelines are available from SEMI and continue to be valid for use.

1 Purpose

1.1 These terms and definitions describe various components and characteristics of backlight units used for light sources of liquid crystal displays. This Standard will be helpful to unify terminologies used for backlight units, which will improve manufacturing efficiency by saving manufacturing cost and time.

2 Scope

2.1 This Standard is applicable to backlight units. The Standard includes the terminologies of components used in backlight units, inspection and measurement used in backlight unit industry as well as panel and instrument industry. The other areas are handled in other SEMI Standards Documents.

NOTICE: SEMI Standards and Safety Guidelines do not purport to address all safety issues associated with their use. It is the responsibility of the users of the Documents to establish appropriate safety and health practices, and determine the applicability of regulatory or other limitations prior to use.

3 Limitations

3.1 In this Standard, our target is limited to backlight units and to define their general terminology. Hence any special term used for critical purpose is not mentioned. For example, we do not define special terms depending on personal emotion and any detail or specific components depending on special or general purpose.

3.2 The definition of lamp components which is out of this Standard's scope follows the terminologies used in lighting industry or other standards. See ¶ 4.2.

4 Referenced Standards and Documents

4.1 CIE Standard¹

CIE 1931 — Color Space, CIE 1976 UCS

4.2 IEC Standard²

IEC 60050-845 — International Electro Technical Vocabulary, Lighting Vocabulary

NOTICE: Unless otherwise indicated, all documents cited shall be the latest published versions.

5 Terminology

5.1 General Terminology

5.1.1 Definition of Backlight Unit

5.1.1.1 A backlight unit (BLU) is the kind of light source positioned at the backside of a liquid crystal panel. Since LCDs are non-emissive display devices, it needs light source essentially.

¹ CIE International Commission on Illumination, Kegelgasse 27, A-1030 Vienna, Austria

² International Electrotechnical Commission, 3 rue de Varembe, Case Postale 131, CH-1211 Geneva 20, Switzerland; Telephone: +41.22.919.02.11, Fax: +41.22.919.03.00, <http://www.iec.ch>

5.1.2 Structure of BLUs

5.1.2.1 As an initial light source, cold cathode fluorescence lamp (CCFL) is used at the bottom or the lateral side of BLUs. The light emitted from CCFLs is entered into a light guide plate (LGP). Here light is spread out to be two-dimensional light source at the back surface of a LGP or inside of a LGP. Two-dimensional light is sometimes defused by diffusion sheets or converted by prism sheets respectively. And final light comes into human eyes.

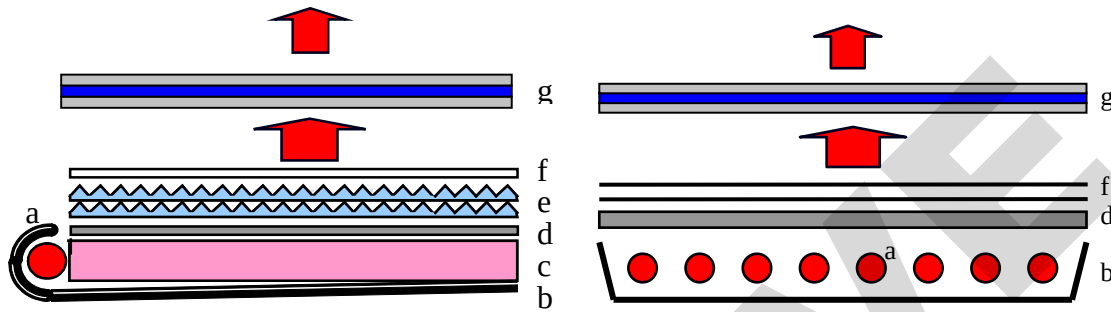


Figure 1
General structures of side (lateral) type (left) and direct type (right) BLU;
from a to g, each components indicates a CCFL, a reflection sheet, a light guide plate,
a diffusion sheet, two prism sheets, a protection sheet and panel respectively.

5.2 *Components* — The following measurement items are recommended for BLU but these items depend on user requirements if they are specified.

5.2.1 *cold cathode fluorescence lamp* — the fluorescence lamp with cold cathode, in which the glow discharge is generated by the secondary emission of electrons from the cathode. With the fluorescence material coated on the inner surface of the lamp excited by the ultraviolet ray from the positive column, the lamp emits visible ray.

5.2.2 *reflection sheet* — the sheet that reflects the light to prevent the loss of the light toward the back side of the BLU.

5.2.3 *light guide plate* — an optical component used to guide and diffuse light from a light source.

5.2.4 *diffusion sheet* — the sheet which diffuses incident light toward panel.

5.2.5 *prism sheet* — the film which improves condensation efficiency and brightness by optimizing the prism shape, in general.

5.2.6 *protection sheet* — the sheet placed on the top of BLU for protecting other components from damage of outside.

5.2.7 *frame* — the frame to make the components of the BLU stably combined.

5.2.8 *electrode* — the conductor, the part to supply the power into the lamp. It releases the electron by the electric current.

5.2.9 *hot (electrode)* — the electrode connected with the high-voltage side (hot side) of the inverter.

5.2.10 *ground (electrode)* — the opposite electrode of the hot electrode in the lamp, which is connected with the low-voltage side (ground side) of the inverter.

5.2.11 *inverter* — the circuit device to convert the low voltage DC into the high voltage RF in order to light on the CCFL.

5.2.12 *lamp* — the light source of the BLU. A CCFL is mainly used.

5.2.13 *lamp assembly* — the lamp and the parts directly mounted on the lamp.

5.2.14 *lamp cover* — the part protecting lamp. It makes the light emitted from the luminance factor be incident into the light guide plate.