

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

Liquid crystal display devices –  
Part 2-1: Passive matrix monochrome LCD modules – Blank detail specification

Dispositifs d'affichage à cristaux liquides –  
Partie 2-1: Modules d'affichage à cristaux liquides (LCD) monochromes à  
matrice passive – Spécification particulière cadre



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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## LIQUID CRYSTAL DISPLAY DEVICES –

**Part 2-1: Passive matrix monochrome LCD modules –  
Blank detail specification**

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International Standard IEC 61747-2-1 has been prepared by IEC technical committee 110: Electronic display devices.

This second edition of IEC 61747-2-1 cancels and replaces the first edition published in 1998, and constitutes a technical revision. The main changes from the previous edition are as follows:

- several words and test conditions were added in Clause 7 and Clause 8;
- the new edition was editorially changed according to the current ISO/IEC Directives – Part 2.

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

CDV	Report on voting
110/371/CDV	110/446/RVC

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

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

A list of all the parts in the IEC 61747 series, under the general title *Liquid crystal display devices*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site 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- withdrawn,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.

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## LIQUID CRYSTAL DISPLAY DEVICES –

### Part 2-1: Passive matrix monochrome LCD modules – Blank detail specification

#### 1 General

##### 1.1 Scope

This part of IEC 61747 serves as a Blank Detail Specification (BDS) for a high quality approval system and contains requirements for style and layout and minimum content of detail specifications. These requirements are applicable when the detail specification is published (e.g. for standard product).

##### 1.2 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 61747-1:2003, *Liquid crystal and solid-state display devices – Part 1: Generic specification*

IEC 61747-2:1998, *Liquid crystal and solid-state display devices – Part 2: Liquid crystal display modules – Sectional specification*

IEC 61747-5:1998, *Liquid crystal and solid-state display devices – Part 5: Environmental, endurance and mechanical test methods*

#### 2 Guidance for preparation of a detail specification

The front page layout is illustrated. When the detail specifications for customer circuits are not published, the layout requirements of the blank detail specification are optional. A suggested front page layout is also illustrated. An example of a Customer Detail Specification (CDS) is also given.

The numbers between square brackets on the front page of the blank detail specification illustrated correspond to the following indications which should be given:

- [1] The name of the National Standards Organization under whose authority the detail specification is issued.
- [2] The IECQ number of the detail specification.
- [3] The numbers and issue numbers of the generic and sectional specifications.
- [4] The national number of the detail specification, date of issue and any further information, if required by the national system.
- [5] Type number(s) of component.
- [6] Information on typical construction and applications. If a device is designed to satisfy several applications, this shall be stated here. Characteristics, limits and inspection

requirements for these applications shall be met. If a device is electrostatic sensitive, or contains hazardous materials, a caution statement shall be added in the detail specification.

[7] Outline drawing and/or reference to the relevant document for outlines.

[8] Category of assessment quality.

[9] Reference data on the most important properties to permit comparison between types.

Layout of Blank Detail Specification (BDS):

[Name (address) of responsible NAI (and possibly of body from which specification is available).]	[1] [Number of IECQ detail specification plus issue number and/or date.] [2]
ELECTRONIC COMPONENTS OF ASSESSED QUALITY IN ACCORDANCE WITH: Generic specification: IEC 61747-1/QC 720000 [and national references if different.]	[3] [National number of detail specification] [4]  [This box need not be used if national number repeats IECQ number.]
BLANK DETAIL SPECIFICATION FOR: PASSIVE MATRIX MONOCHROME LCD MODULES [5] [Type number(s) of the relevant device(s) and if appropriate structurally similar devices.] Ordering information: see Clause 5 of this specification.	
Mechanical description	Short description
Outline references: [Mandatory if available, IEC and/or national number] Structure: e.g. - LCD with electronic circuits (IC) mounted on cell substrate or separate PWB - integrated backlight  Outline drawing and dimensions: - overall dimensions - viewing area - effective display area  Display format: - number of rows and columns - pixel size - pixel pitch  Connection type: e.g. - pin identification - connector identification - type number of connector used - type number of mating connector  Marking: [The detail specification shall prescribe the information to be marked on the device.] [See Clause 4, and 4.4 of the generic specification.] Mass:	[7] Type of electro-optical effect [6] e.g. - Twisted Nematic (TN), Supertwisted Nematic (STN), etc.  Optical mode of operation: e.g. - reflective, transreflective, transmissive - grey scale: number - light image on a dark background, dark image on a light background  Preferred viewing direction:  Electrical specification: e.g. - interface (supply, data) - backlight (e.g. fluorescent lamp CCFL (cold cathode fluorescent lamp)/HCFL (hot cathode fluorescent lamp), LED, EL)  Application(s): e.g. - personal computer, automobile
Categories of assessed quality	
[8] [See 4.5 of the generic specification IEC 61747-1:2003.]	
Reference data [9]	
Information about manufacturers who have components qualified to this detail specification is available in the current qualified products list.	



### 3 Marking

Refer to A.1.

### 4 Ordering information

The following minimum information is necessary to order a specified device, unless otherwise specified:

- precise type reference;
- IECQ reference of detail specification with issue number and/or date when relevant;
- category of assessed quality as defined in 4.5 of the generic specification IEC 61747-1:2003 and, if required, screening sequence as defined in 4.8 of the sectional specification IEC 61747-2:1998;
- any other particulars.

### 5 Limiting values (absolute maximum rating system)

The values in Table 1 apply over the operating temperature range unless otherwise specified.

Figure 1 shows the block diagram examples for explanation of supply voltages which are denoted in Table 1. GND shows the ground voltage level.

The “X” denotes that a value shall be inserted in the detail specification. Repeat only subclause numbers used with title. Any additional values shall be given at the appropriate place, but without subclause number(s).

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**Table 1 – Limiting values**

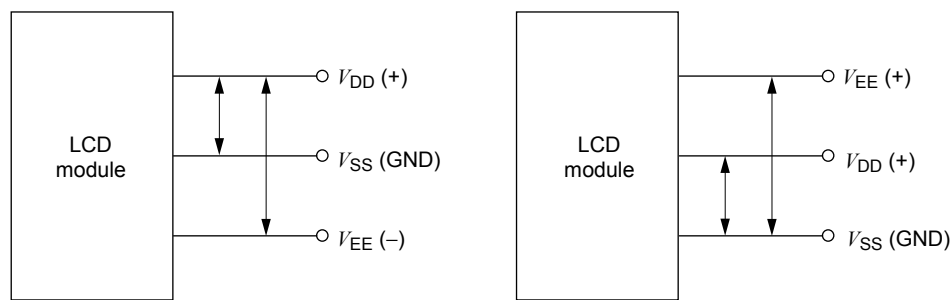
Subclause	Parameters	Symbol	Value		Unit
			Minimum	Maximum	
5.1	Operating ambient temperature	$T_{op}$	X	X	°C
5.2	Storage temperature	$T_{stg}$	X	X	°C
5.3	Supply voltage(s)				
5.3.1	Supply voltage for logic drive	$V_{DD} - V_{SS}$	X	X	V
5.3.2	Supply voltage for LCD drive	$V_{DD} - V_{EE}$ or $V_{EE} - V_{SS}$ or $V_O - V_{SS}$ or $V_{DD} - V_O$	X	X	V
5.4	Input signal voltage	$V_{IN}$	X	X	V
5.5					
5.5.1	Backlight voltage (where appropriate)	$V_{BL}$		X	V
5.5.2	Backlight current (where appropriate)	$I_{BL}$		X	mA
5.6	Soldering temperature (where appropriate)	$T_{sld}$		X	°C

**Block diagram**

[IEC 61747-2-1:2013](#)

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The internal module circuitry is not required to be disclosed in either the BDS or the CDS.

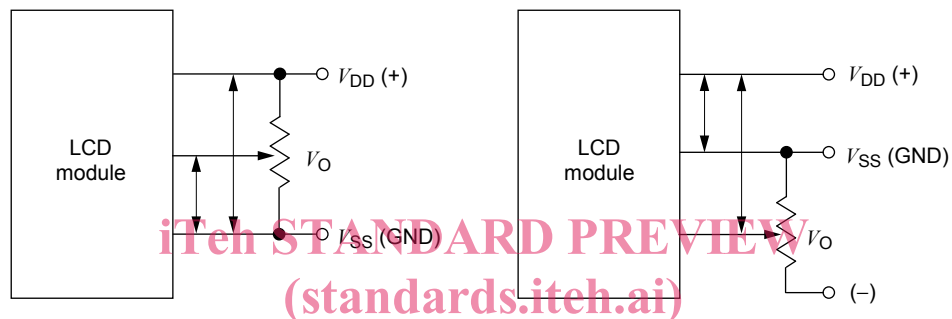


Supply voltage for LCD drive:  $V_{DD} - V_{EE}$

Supply voltage for logic drive:  $V_{DD} - V_{SS}$

Supply voltage for LCD drive:  $V_{EE} - V_{SS}$

Supply voltage for logic drive:  $V_{DD} - V_{SS}$



Supply voltage for LCD drive:  $V_O - V_{SS}$

Supply voltage for logic drive:  $V_{DD} - V_{SS}$

Supply voltage for LCD drive:  $V_{DD} - V_O$

Supply voltage for logic drive:  $V_{DD} - V_{SS}$

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IEC 594/13

**Figure 1 – Block diagram examples for explanation of supply voltages**

## 6 Operating range and electrical and optical characteristics

### 6.1 Recommended operating range

The “X” denotes that a value in Table 2 shall be inserted in the detail specification.

**Table 2 – Recommended operating range**

Subclause	Characteristics at $T_{op} = 25\text{ °C}$ unless otherwise specified	Symbol	Value		Unit
			Minimum	Maximum	
6.1.1	Operating voltage range of supply voltage(s)				
6.1.1.1	Supply voltage for logic drive	$V_{DD} - V_{SS}$	X	X	V
6.1.1.2	Supply voltage for LCD drive	$V_{DD} - V_{EE}$ or $V_{EE} - V_{SS}$ or $V_O - V_{SS}$ or $V_{DD} - V_O$	X	X	V
6.1.2	Operating voltage range of input signal voltages	$V_{IN}$			
6.1.2.1	Input signal voltage, high	$V_{IH}$	X	X	V
6.1.2.2	Input signal voltage, low	$V_{IL}$	X	X	V
6.1.3	Operating voltage range of backlight voltages (where appropriate)	$V_{BL}$	X	X	V
6.1.4	Operating frequency range(s) (where appropriate)	$f_{op}$			
6.1.4.1 and/or	Operating frame frequency range	$f_{FRM}$	X	X	Hz
6.1.4.2	Oscillator frequency range	$F_{osc}$	X	X	Hz

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**6.2 Electrical and optical characteristics**

See Clause 8 for inspection requirements.

The “X” denotes that a value in Table 3 shall be inserted in the detail specification. Repeat only the subclause numbers used with the title. Any additional characteristics shall be given at the appropriate place but without the subclause number(s).

When several devices are defined in the same detail specification, the relevant values shall be given on successive lines, avoiding repeating identical values.