

INTERNATIONAL STANDARD

Liquid crystal display devices –
Part 3-1: Liquid crystal display (LCD) cells – Blank detail specification

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LIQUID CRYSTAL DISPLAY DEVICES –**Part 3-1: Liquid crystal display (LCD) cells –
Blank detail specification**

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International Standard IEC 61747-3-1 has been prepared by IEC technical committee 110: Electronic display devices.

This third edition cancels and replaces the second edition, published in 2006. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- the new edition was editorially changed in accordance with current ISO/IEC directives.

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

FDIS	Report on voting
110/641/FDIS	110/655/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.

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

A list of all parts of 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- withdrawn,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.

A bilingual version of this publication may be issued at a later date.

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LIQUID CRYSTAL DISPLAY DEVICES –

Part 3-1: Liquid crystal display (LCD) cells – Blank detail specification

1 Scope

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

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 60749-14, *Semiconductor devices – Mechanical and climatic test methods – Part 14: Robustness of terminations (lead integrity)*

IEC 61747-1-1:2014, *Liquid crystal display devices – Part 1-1: Generic specification*

IEC 61747-3:2006, *Liquid crystal display devices – Part 3: Liquid crystal display (LCD) cells - Sectional specification*

IEC 61747-10-2:2014, *Liquid crystal display devices – Part 10-2: Environmental and endurance*

3 Required information

Numbers shown in brackets on this and the following pages correspond to the following items of required information, which shall be entered in the spaces provided.

3.1 Identification of the detail specification

- [1] The name of the National Standards Organization under whose authority the detail specification is issued.
- [2] The numbers and issue numbers of the generic and sectional specifications.
- [3] The national number of the detail specification, data of issue and any further information, if required by the national system.

3.2 Identification of the component

- [4] Type of component.
- [5] 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 electrostatically sensitive, or contains hazardous materials, a caution statement shall be added in the detail specification.
- [6] Outline drawing and/or reference to the relevant document for outlines.

[7] Category of assessment quality.

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

[Throughout this specification, the text given in square brackets is intended for guidance to the specification writer and shall not be included in the detail specification.]

[Throughout this specification, when a characteristic or rating applies, “x” denotes that a value shall be inserted in the detail specification.]

[Name (address of responsible NAI (National Authorized Institution) [1] (and possibly of body from which specification is available).]	[Issue number and/or date.] [2]
ELECTRONIC COMPONENT OF ASSESSED QUALITY IN ACCORDANCE WITH: [3] Generic specification: IEC 61747-1-1 Sectional specification: IEC 61747-3 [and national reference if different]	[National number of detail specification.] [4]
BLANK DETAIL SPECIFICATION FOR: SEGMENT TYPE MONOCHROME LCD CELLS [5] [Type number(s) of the relevant device(s) and if appropriate structurally similar devices.] Ordering information: see Clause 5 of this specification.	
4 Mechanical description	5 Short description
Outline references: [7] [Mandatory if available, IEC number and/or national] Construction: e.g. with/without polarizer and/or reflector Outline drawing and dimensions: e.g. overall dimensions effective display area Display format: e.g. display design, etc. Connection type: e.g. pin identification Marking: letters and figures, or colour code. [The detail specification shall prescribe the information to be marked on the device.] [See 4.3 of IEC 61747-1-1:2014 and Clause 4 of this specification.] Mass:	Type of electro-optical effect: [6] e.g. TN (twisted nematic), STN (super twisted nematic), etc. Optical mode of operation: e.g. reflective, transfective, etc. Preferred viewing direction: e.g. Electrical specification: e.g. interface (data) Applications: e.g. watch, indication equipment, etc. 6 Categories of assessed quality [See 4.4 of IEC 61747-1-1:2014.] [8] Reference data [9]
Information about manufacturers that have components qualified to this detail specification is available in the current qualified products list.	

7 Marking

[Any particular information other than that given in box [7] (Clause 4) and/or 4.3 of the generic specification (IEC 61747-1-1:2014) shall be given here.]

8 Ordering information

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

- precise type reference;
- issue number and/or data when relevant;
- category of assessment quality as defined in 4.4 of the generic specification (IEC 61747-1-1:2014) and, if required, screening sequence as defined in 4.8 of the sectional specification (IEC 61747-3:2006);
- any other particulars.]

9 Limiting values (absolute maximum rating system)

These values apply over the operating temperature range, unless otherwise specified.

[Repeat only the subclause numbers used with the title. Any additional values shall be given at the appropriate place, but without the subclause number(s).]

Subclause	Parameters	Symbol	Value		Unit
			Min.	Max.	
9.1	Operating voltage	V_{op}	x	x	V
9.2	DC component of voltage	–	–	x	V
9.3	Operating frequency	f_{op}	x	x	Hz
9.4	Operating ambient temperature	T_{op}	x	x	°C
9.5	Storage temperature	T_{stg}	x	x	°C

10 Operating range and electrical and optical characteristics

10.1 Recommended operating conditions (with the specified operating temperature range)

Subclause	Parameters	Symbol	Value	Unit
10.1.1	Operating voltage	V_{op}	x	V
10.1.2	Operating frequency	f_{op}	x	Hz
10.1.3	Operating ambient temperature	T_{op}	x	°C

10.2 Electrical and optical characteristics

See Clause 8 of this specification for test requirements.

[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.]

Subclause	Characteristics at $T_{op} = 25\text{ °C}$, unless otherwise specified (see Clause 6 of IEC 61747-1-1:2014)	Symbol	Unit	Value		Tested in Subgroup
				Min.	Max.	
10.2.1	Current consumption	I_{tot}	mA	–	x	C2a
10.2.2	Turn-on time	t_{on}	ms	–	x	C2a
10.2.3	Turn-off time	t_{off}	ms	–	x	C2a
10.2.4	Contrast ratio	CR_{dir}		x	–	C2b
		CR_{diff}		x		C2b
10.2.5	Viewing angle range	θ_H, θ_V	°	x	–	C2a
10.2.6	Total parallel segment resistance	R_{tot}	Ω	x	–	A3
10.2.7	Total parallel segment capacitance	C_{tot}	F	–	x	A3

11 Test conditions requirements

11.1 General

These are given in the following tables, where the values and exact test conditions to be used shall be specified as required for a given type, and as required by the relevant tests in the relevant publications.

When several devices are included in the same detail specification, the relevant conditions and/or values should be given in sequence, avoiding where possible, repetition of identical conditions and/or values.

Tests shall be made at 25 °C, unless otherwise specified.

Tests marked (D) are destructive.

11.2 GROUP A – Lot-by-lot tests

Subgroup	Tests (or measurements)	Conditions at $T_{op} = 25\text{ °C}$, unless otherwise specified (see Clause 6 of IEC 61747-1-1:2014)	Limits	
			Min.	Max.
A1	External visual examination		See 6.2.1 of the generic specification (IEC 61747-1-1:2014)	
A2	Visual defects		See IEC 61747-10-2	
A3	Current consumption			X
	Total parallel segment resistance		x	
	Total parallel segment capacitance			X
A4	Contrast ratio		x	
	Viewing angle range		x	
Those subgroups which are not specified in the IEC specifications shall be specified in the detail specification.				

11.3 GROUP B – Lot-by-lot tests

Subgroup	Tests	Conditions at $T_{op} = 25\text{ °C}$, unless otherwise specified (see Clause 6 of IEC 61747-1-1:2014)	Limits	
			Min.	Max.
B1	Dimensions		[See Clause 1 of this specification]	
B4	Solderability (D)	[As specified]	Good wetting	
B5	Rapid change of temperature (D)	Test [Nb], $T_A =$, $T_B =$, number of cycle = a rate of change of temperature	Detection of intermittent failures	
B6	Acceleration, steady-state (D)	To be specified, in the detail specification. As in subgroups A2		
B8	Electrical endurance (168 h) (D)	As in subgroups A2, A3 and A4		
B9	Storage (at high temperature) (D)	168 h (at maximum storage temperature). As in subgroups A2, A3 and A4		
Subgroup CRRL	Certified records of released lots	Attributes information for B5, B6, B8 and B9		

Those subgroups which are not specified in the IEC specifications shall be specified in the detail specification.

NOTE In case of category I, see 4.4 in IEC 61747-1-1:2014.

11.4 GROUP C – Periodic tests

Subgroup	Tests (or measurements)	Conditions at $T_{op} = 25\text{ °C}$, unless otherwise specified (see Clause 6 of IEC 61747-1-1:2014)	Limits	
			Min.	Max.
C1	Dimensions		[See Clause 1 of this specification]	
C2a	Current consumption	At maximum and minimum operating temperatures		X
	Turn-on time			X
	Turn-off time			X
	Viewing angle range		x	
C2b	Contrast ratio		x	
C3	Robustness of termination (D)	[Value = according to IEC 60749-14]	[No damage as specified]	
C5	Resistance to soldering heat and rapid change of temperature, followed by: – low air pressure – electrical and optical characteristics test (D)	[As specified] As in subgroups A2, A3 and A4		
C6	Mechanical shock or vibration, followed by – acceleration, steady state – electrical and optical characteristics test (D)	[As specified.] As in subgroups A2, A3 and A4		