BRITISH STANDARD

BS EN
61747-3-1:2006

Liquid crystal display devices —

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

The European Standard EN 61747-3-1:2006 has the status of a British Standard

ICS 31.120; 31.260

BSI
British Standards

National foreword

This British Standard was published by BSI. It is the UK implementation of EN 61747-3-1:2006. It is identical with IEC 61747-3-1:2006. It supersedes BS EN 61747-3-1:2000, which will be withdrawn on 1 October 2009.

The UK participation in its preparation was entrusted to Technical Committee EPL/47, Semiconductors.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 29 June 2007

ISBN 978 0 580 55193 2

Amendments issued since publication

Amd. No.	Date	Comments

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61747-3-1

November 2006

ICS 31.120

Supersedes EN 61747-3-1:1999

English version

Liquid crystal display devices
Part 3-1: Liquid crystal display (LCD) cells - Blank detail specification
(IEC 61747-3-1:2006)

Dispositifs d'affichage à cristaux liquides
Partie 3-1: Cellules d'affichage à cristaux liquides (LCD) -
Spécification particulière cadre
(CEI 61747-3-1:2006)

Flüssigkristall-Anzeige-Bauelemente
Teil 3-1: Flüssigkristall-Anzeigezellen (LCD-Zellen) -
Vordruck für Bauartspezifikation
(IEC 61747-3-1:2006)

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Ref. No. EN 61747-3-1:2006 E

Foreword

The text of document 110/88/FDIS, future edition 2 of IEC 61747-3-1, prepared by IEC TC 110, Flat panel display devices was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61747-3-1 on 2006-10-01.

This European Standard supersedes EN 61747-3-1:1999.

The main changes with regard to EN 61747-3-1:1999 concern editorial updating in accordance with current ISO/IEC directives.

This part of EN 61747 is a blank detail specification for liquid crystal display cells. It should be read together with the generic specification and sectional specification to which it refers.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2007-07-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2009-10-01

Annex ZA has been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 61747-3-1:2006 was approved by CENELEC as a European Standard without any modification.

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LIQUID CRYSTAL DISPLAY DEVICES –

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

INTRODUCTION

The IEC quality assessment system for electronic components is operated in accordance with the statutes of the IEC and under the authority of the IEC. The object of this system is to define assessment procedures in such a manner that electronic components released by one participating country as conforming with the requirements of an applicable specification are equally acceptable in all participating countries without the need for further testing.

This blank detail specification is one of a series of blank detail specifications for liquid crystal display devices and should be used with the following IEC publications:

IEC 61747-1:1998, *Liquid crystal and solid-state display devices – Part 1: Generic specification*

IEC 61747-3:1998, *Liquid crystal display devices – Part 3: Liquid crystal display (LCD) cells - Sectional specification*

Required information

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

Identification of the detail specification

[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, data of issue and any further information, if required by the national system.

Identification of the component

[5] Type 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 electrostatically 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.

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

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

<table>
<tr><td>[Name (address of responsible NAI (and possibly of body from which specification is available).] [1]</td><td>[Number of IECQ detail specification plus issue number and/or date.] [2]</td></tr>
<tr><td>ELECTRONIC COMPONENT OF ASSESSED QUALITY IN ACCORDANCE WITH: [3]

Generic specification:
IEC 61747-1/QC 720000
Sectional specification:
IEC 61747-3/QC 720200
[and national reference if different]</td><td>[National number of detail specification.] [4]

[This box need not be used if national number repeats IECQ number.]</td></tr>
<tr><td colspan="2">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.</td></tr>
<tr><td>1 Mechanical description</td><td>2 Short description</td></tr>
<tr><td rowspan="4">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 4.4 of the generic specification and Clause 4 of this standard.]

Mass:</td><td>Type of electro-optical effect: [6]
e.g. TN, STN, etc.

Optical mode of operation:
e.g. reflective, transflective, etc.

Preferred viewing direction:
e.g.

Electrical specification:
e.g. interface (data)

Applications:
e.g. watch, indication equipment, etc.</td></tr>
<tr><td>3 Categories of assessed quality</td></tr>
<tr><td>[8]
[See 4.5 of the generic specification.]</td></tr>
<tr><td>Reference data [9]</td></tr>
<tr><td colspan="2">Information about manufacturers who have components qualified to this detail specification is available in the current qualified products list.</td></tr>
</table>

4 Marking

[Any particular information other than that given in box [7] (Clause 1) and/or 4.4 of the generic specification (IEC 61747-1) shall be given here.]

5 Ordering information

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

– precise type reference;
– IECQ reference of detail specification with issue number and/or data when relevant;
– category of assessment quality as defined in 4.5 of the generic specification (IEC 61747-1) and, if required, screening sequence as defined in 4.8 of the sectional specification (IEC 61747-3);
– any other particulars.]

6 Limiting values (absolute maximum rating system)

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

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

Subclause	Parameters	Symbol	Value		Unit
			Min.	Max.	
6.1	Operating voltage	V_{op}	x	x	V
6.2	DC component of voltage	–	–	x	V
6.3	Operating frequency	f_{op}	x	x	Hz
6.4	Operating ambient temperature	T_{op}	x	x	°C
6.5	Storage temperature	T_{stg}	x	x	°C

7 Operating range and electrical and optical characteristics

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

Subclause	Parameters	Symbol	Value	Unit
7.1.1	Operating voltage	V_{op}	x	V
7.1.2	Operating frequency	f_{op}	x	Hz
7.1.3	Operating ambient temperature	T_{op}	x	°C

7.2 Electrical and optical characteristics

See Clause 8 of this specification for test requirements.

[Repeat only subclause numbers used with title. Any additional characteristics shall be given at the appropriate place, but without 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 °C, unless otherwise specified (see Clause 6 of the generic specification)	Symbol	Unit	Value		Tested in subgroup
				Min.	Max.	
7.2.1	Current consumption	I_{tot}	mA	–	x	C2a
7.2.2	Turn-on time	t_{on}	ms	–	x	C2a
7.2.3	Turn-off time	t_{off}	ms	–	x	C2a
7.2.4	Contrast ratio	CR_{dir} CR_{diff}		x	–	C2b
7.2.5	Viewing angle range	θ_H, θ_V	°	x	–	C2a
7.2.6	Total parallel segment resistance	R_{tot}	Ω	x	–	A3
7.2.7	Total parallel segment capacitance	C_{tot}	F	–	x	A3

8 Test conditions requirements

[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.

8.1 GROUP A – Lot-by-lot tests

Subgroup	Tests (or measurements)	Conditions at T_{op} = 25 °C, unless otherwise specified (see Clause 6 of the generic specification)	Limits	
			Min.	Max.
A1	External visual examination		See 6.2.1 of the generic specification (IEC 61747-1)	
A2	Visual defects		See IEC 61747-5	
A3	Current consumption			x
	Total parallel segment resistance		x	
	Total parallel segment capacitance			x
A4	Contrast ratio		x	
	Viewing angle range		x	
Those which are not specified in the IEC specifications shall be specified in the detail specification.				

8.2 GROUP B – Lot-by-lot tests

Subgroup	Tests	Conditions at T_{op} = 25 °C, unless otherwise specified (see Clause 6 of the generic specification)	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 which are not specified in the IEC specifications shall be specified in the detail specification. NOTE In case of category I, see 4.5 in the generic specification.				

8.3 GROUP C – Periodic tests

Subgroup	Tests (or measurements)	Conditions at T_{op} = 25 °C, unless otherwise specified (see Clause 6 of the generic specification)	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		
C7	Damp heat cycling (D)	240 h for CAT.I 500 h for CAT.II 1 000 h for CAT.III As in subgroups A2, A3 and A4		
C8	Electrical endurance (D)	240 h for CAT.I 500 h for CAT.II 1 000 h for CAT.III As in subgroups A2, A3 and A4		
C9a	Storage (at high temperature) (D)	240 h for CAT.I 500 h for CAT.II at $T_{stg\ max}$ 1 000 h for CAT.III As in subgroups A2, A3 and A4		
C9b	Storage (at low temperature) (D)	240 h for CAT.I 500 h for CAT.II at $T_{stg\ max}$ 1 000 h for CAT.III As in subgroups A2, A3 and A4		
C11a	Light exposure (D)	As in subgroup A4		
C11b	Permanence of marking (D)	To be specified		
Subgroup CRRL	Certified records of released lots	Attributes Information for C5, C6, C7, C8, C9 and C10		
Those which are not specified in the IEC specifications shall be specified in the detail specification.				

9 Group D – Qualification approval tests

[When required, these tests shall be prescribed in the detail specification for qualification approval only.]

10 Additional information

[To be given only as far as necessary for the specification and use of the device, for instance:

10.1 Temperature derating curves referred to in the limiting values;
10.2 Complete definition of a circuit for measurement, or of an additional method;
10.3 Detail outline drawing;
10.4 Character dimensions;
10.5 Electrical driving conditions;
10.6 Handling information;
10.7 Precautions with respect to electrostatic discharge;
10.8 Precautions for installation, mechanical and/or electrical;
10.9 Hazard/safety and disposal/recycling information;
10.10 Characterization of diffuse and specular reflectance and transmittance.]

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BSI — British Standards Institution

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