



## DRAFT TANZANIA STANDARD

(Draft for comments only)

---

Liquid crystal display devices - Part 1-1: Generic - Generic specification

*Draft for stakeholders' comments only*

**TANZANIA BUREAU OF STANDARDS**

---

## 1 National Foreword

This draft Tanzania Standard is being prepared by the Communication Equipment Technical Committee, under the supervision of the Electrotechnical divisional standards committee (EDC)

This draft Tanzania Standard is an adoption of the International Standard **IEC 61747-1-1: 2014** *Liquid crystal display devices - Part 1-1: Generic - Generic specification*, Which has been prepared by the International Electrotechnical Commission.

## 2 Terminology and conventions

Some terminologies and certain conventions are not identical with those used in Tanzania standards; attention is drawn especially to the following: -

- a) The comma has been used as a decimal marker for metric dimensions. In Tanzania Standards, it is current practice to use "full point" on the baseline as the decimal marker.
- b) Where the words "International Standard(s)" appear, referring to this standard they should read "Tanzania Standard(s)".

Draft for stakeholders' comments only

# INTERNATIONAL STANDARD

---

Liquid crystal display devices –  
Part 1–1: Generic – Generic specification

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

PRICE CODE

ICS 31.120

ISBN 978-2-8322-1805-1

**Warning! Make sure that you obtained this publication from an authorized distributor.**

## CONTENTS

FOREWORD .....	4
1 Scope .....	6
2 Normative references .....	6
3 Terms and definitions .....	7
4 Technical aspects .....	7
4.1 Order of precedence .....	7
4.2 Standard environmental conditions .....	7
4.3 Marking .....	7
4.3.1 Device identification .....	7
4.3.2 Device traceability .....	7
4.3.3 Packing .....	7
4.4 Categories of assessed quality .....	8
4.5 Screening .....	8
4.6 Handling .....	8
5 Quality assessment procedures .....	8
5.1 General .....	8
5.2 Commercially confidential information .....	9
5.3 Formation of inspection lots .....	9
5.4 Structurally similar devices .....	9
5.5 Granting of qualification approval .....	9
5.6 Quality conformance inspection .....	10
5.6.1 General .....	10
5.6.2 Division into groups and subgroups .....	10
5.6.3 Inspection requirements .....	11
5.6.4 Supplementary procedure for reduced inspection .....	13
5.6.5 Sampling requirements for small lots .....	13
5.6.6 Certified records of released lots (CRRL) .....	13
5.6.7 Delivery of devices subjected to destructive or non-destructive tests .....	14
5.6.8 Delayed deliveries .....	14
5.6.9 Supplementary procedure for deliveries .....	14
5.7 Statistical sampling procedures .....	14
5.7.1 General .....	14
5.7.2 AQL sampling plans .....	14
5.7.3 LTPD sampling plans .....	14
5.8 Endurance tests .....	14
5.9 Endurance tests where the failure rate is specified .....	14
5.9.1 Overview .....	14
5.9.2 General .....	14
5.9.3 Selection of samples .....	15
5.9.4 Failure .....	15
5.9.5 Endurance test time and sample size .....	15
5.9.6 Procedure to be used if the number of observed failures exceeds the acceptance number .....	15
6 Test and measurement procedures .....	16
6.1 Standard atmospheric conditions for electrical and optical measurements .....	16
6.2 Physical examination .....	16

6.2.1	Visual examination .....	16
6.2.2	Dimensions .....	16
6.3	Electrical and optical measurements .....	17
6.3.1	Alternative methods .....	17
6.3.2	Precision of measurements .....	17
6.3.3	General precautions .....	17
6.4	Environmental tests .....	17
6.5	Mechanical tests .....	17
Annex A (informative) Examples of outline drawings of liquid crystal display cells .....		18
Annex B (normative) Orientation of LCD modules .....		21
Annex C (informative) Lot tolerance percentage defective (LTPD) sampling plans .....		22
C.1	General .....	22
C.1.1	Overview .....	22
C.1.2	Selection of samples .....	22
C.1.3	Failures .....	22
C.2	Single-lot sampling method .....	22
C.2.1	General .....	22
C.2.2	Sample size .....	22
C.2.3	Acceptance procedure .....	22
C.3	Additional sample .....	23
C.4	Multiple criteria .....	23
C.5	100 % inspection .....	23
C.6	Tightened inspection .....	23
Bibliography .....		28
Figure A.1 – Example of outline drawings of liquid crystal display cells .....		18
Figure A.2 – Example of outline drawings of liquid crystal display cells .....		19
Figure B.1 – Orientation of LCD modules .....		21
Table A.1 – Example of table for dimension of each element .....		19
Table C.1 – LTPD sampling plans .....		24
Table C.2 – Hypergeometric sampling plans for small lot sizes of 200 or less .....		26
Table C.3 – AQL and LTPD sampling plans .....		27

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**LIQUID CRYSTAL DISPLAY DEVICES – Part 1-1:****Generic – Generic specification FOREWORD**

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

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

This Part 1-1 forms the generic specification for liquid crystal display devices.

This first edition cancels and replaces the first edition of IEC 61747-1 published in 1998 and Amendment 1:2003. This edition constitutes a technical revision.

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

- a) IEC 61747-1, has been divided into IEC 61747-1-1, *Liquid crystal display devices – Part 1-1: Generic – Generic specification* and IEC 61747-1-2, *Liquid crystal display devices – Part 1-2: Generic – Terminology and letter symbols*;
- b) the contents of the terminology have been transferred to IEC 61747-1-2;

- c) Annex C has been changed from normative to informative, because Tables C.1 and C.2 mismatch some of the large scale production practices of recent date;
- d) References cited have been updated.

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

CDV	Report on voting
110/527/CDV	110/563/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.

NOTE The structure of the IEC 61747 series and the changes in the numbering are shown in Annex D of IEC 61747-30-1:2012.

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.

## LIQUID CRYSTAL DISPLAY DEVICES –

### Part 1–1: Generic – Generic specification

#### 1 Scope

This part of IEC 61747 is a generic specification for liquid crystal display devices. It defines general procedures for testing and gives general rules for the measuring methods of the electrical and optical characteristics, the rules for climatic and mechanical tests, and the rules for endurance tests.

#### 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 60410:1973, *Sampling plans and procedures for inspection by attributes*

IEC 60747 (all parts), *Semiconductor devices – Discrete devices*

IEC 60747-1:2006, *Semiconductor devices – Part 1: General*

IEC 60747-10:1991, *Semiconductor devices – Part 10: Generic specification for discrete devices and integrated circuits*

IEC 60748 (all parts), *Semiconductor devices – Integrated circuits*

IEC 60749, *Semiconductor devices – Mechanical and climatic test methods*

IEC 61747-1-2, *Liquid crystal display devices – Part 1-2: Terminology and letter symbols*

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

IEC 61747- 10-1, *Liquid crystal display devices – Part 10-1: Environmental, endurance and mechanical test methods – Mechanical*

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

IEC 61747-20 (all parts), *Liquid crystal display devices – Visual inspection*

IEC 61747-30-1, *Liquid crystal display devices – Part 30-1: Measuring methods for liquid crystal display modules – Transmissive type*

ISO 2859 (all parts), *Sampling procedures for inspection by attributes*

ISO 2859-1, *Sampling procedures for inspection by attributes – Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*



ISO 2859 -10, *Sampling procedures for inspection by attributes – Part 10: Introduction to the ISO 2859 series of standards for sampling for inspection by attributes*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61747-1-2 apply.

### 4 Technical aspects

#### 4.1 Order of precedence

Where there are conflicting requirements, documents shall rank in the following order of authority:

- a) the detail specification;
- b) the blank detail specification;
- c) the family specification, if any;
- d) the sectional specification;
- e) the generic specification;
- f) the basic specification;
- g) international (e.g. IEC) documents to which reference is made;
- h) a national document.

The same order of precedence shall apply to equivalent national documents.

#### 4.2 Standard environmental conditions

The preferred values of temperature, humidity and pressure for the measurement of characteristics, for tests and for operating conditions, are a temperature of  $25\text{ °C} \pm 5\text{ °C}$ , a relative humidity of 45 %RH to 75 %RH, and a pressure of 86 kPa to 106 kPa.

#### 4.3 Marking

##### 4.3.1 Device identification

The marking on the device shall enable clear identification of the device.

##### 4.3.2 Device traceability

The device shall be provided with a traceability code which enables back-tracing of the device to a certain production or inspection lot.

##### 4.3.3 Packing

The marking on the packing shall state:

- a) the device identification code;
- b) the traceability code(s) of the enclosed devices;
- c) the number of enclosed devices;
- d) the required precautions, if any.

This marking shall be in accordance with custom regulations.