

INTERNATIONAL STANDARD



**Touch and interactive displays –
Part 13-10: Reliability test methods of touch displays – Environmental durability
test methods**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

TOUCH AND INTERACTIVE DISPLAYS –

**Part 13-10: Reliability test methods of touch displays –
Environmental durability test methods**

FOREWORD

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International Standard IEC 62908–13–10 has been prepared by IEC technical committee TC 110: Electronic display devices.

The text of this International Standard is based on the following documents:

CDV	Report on voting
110/748/CDV	110/790A/RVC

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

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

A list of all parts in the IEC 62908 series, published under the general title *Touch and interactive displays*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
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INTRODUCTION

This part of IEC 62908 was developed in response to the demand for standardization of the test methods for the endurance of touch displays.

The touch display is one of the most important interfaces between a user and a display. Various technologies for touch displays have been developed, and it is expected that touch display technology will make rapid progress in the future. This document is especially effective for capacitive and resistive touch displays.

Durability is one of the most important aspects of touch display modules. Touch displays connected to display modules are used under a variety of environmental conditions, including indoor/outdoor, hot/cold, dry/humid, for long periods of time and may be subjected to severe environmental stress.

This document describes standardized test methods to evaluate the durability of touch displays subjected to environmental stresses. It is valid for research and development, quality assurance, and comparison of devices when making purchasing decisions.

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TOUCH AND INTERACTIVE DISPLAYS –

Part 13-10: Reliability test methods of touch displays – Environmental durability test methods

1 Scope

This part of IEC 62908 specifies the methods for testing the environmental durability of touch display modules, touch sensor modules and test pattern cells, and can be used for devices at the production level, the prototype level or the trial model level when they are exposed to environmental stress.

This document is applicable for touch displays that use capacitive or resistive detection sensors. It may also be applicable to other types of sensors as well as to touch display modules with both flat and flexible displays.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-1:2013, *Environmental testing – Part 1: General and guidance*

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IEC 60068-2-1, *Environmental testing – Part 2-1: Tests – Test A: Cold*

IEC 60068-2-2, *Environmental testing – Part 2-2: Tests – Test B: Dry heat*

IEC 60068-2-14, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

IEC 60068-2-30, *Environmental testing – Part 2: Tests – Test Db: Damp heat, cyclic (12 + 12 h cycle)*

IEC 60068-2-78, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

IEC 61747-30-1:2012, *Liquid crystal display devices – Part 30-1: Measuring methods for liquid crystal display modules – Transmissive type*

IEC 62908-1-21, *Touch and interactive displays – Part 1-2: Generic – Terminology and letter symbols*

IEC 62908-12-102, *Touch and interactive displays – Part 12-10: Measurement methods of touch displays – Touch and electrical performance*

1 Under preparation. Stage at the time of publication: IEC CDV 62908-1-2:2016.

2 Under preparation. Stage at the time of publication: IEC CDV 62908-12-10:2016.

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62908-1-2 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.2 Abbreviated terms

For the purposes of this document, the following abbreviated terms apply.

DUT device under test

4 Device under test (DUT)

4.1 General

The DUT shall be carefully prepared to fulfill the purpose of the test. When it is operated during the test in order to measure performance, it shall be operated in accordance with the actual operation mode of the touch displays or the specific operation mode that is appropriate for the purpose of the test.

4.2 Preparation of the DUT

The following type of DUT can be tested using this document:

- 1) touch display module;
- 2) touch sensor module;
- 3) test pattern cell.

In cases of 1) and 2), the DUT shall be selected or prepared as a DUT that represents the product distribution, or at least the DUT used shall be identified in the report.

In case of 3), in which the DUT is not the complete final product, it shall be prepared carefully enough that the DUT represents the performance of the final products. For example, each component shall be carefully fitted and packaged in order to prevent abnormal phenomena from occurring that would not be observed in the real final products.

The definition of each DUT is described in Annex A.

4.3 Setup of touch display modules

Turn on the power supply and signal generator and warm up the system for stabilisation if stabilisation is required. Power on and send the signal pattern to the touch display module as specified for each inspection.

4.4 Setup of touch sensor modules

When the test requires the operation of the sensor module, turn on the power supply and warm up the system for stabilisation if stabilisation is required. Power on the sensor module as specified for each inspection. The warm-up time for the sensor module shall be sufficiently long to obtain a stable state necessary for the test.

4.5 Setup of test pattern cells

4.5.1 General

Durability tests for test pattern cells shall be conducted in order to clarify the fundamental characteristics of the sensor component particularly for the out-cell type sensors. The DUT represents the performance of the production level.

4.5.2 Test pattern cells for capacitive detection sensors

The test pattern cell can be used in order to check the components of the touch sensor module. A specific circuit pattern that is appropriate for the purpose of the test may be created for the test, as shown in Figure 1. For example, the line width of the circuit pattern is 50 μm , and the distance between lines is 500 μm . The power supply should be the pulse wave. The applied pulse wave should be appropriate for the purpose of the test. An example of the applied pulse wave is shown in Figure 2.

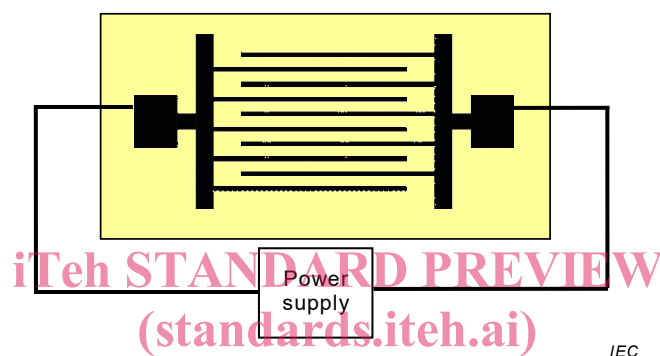
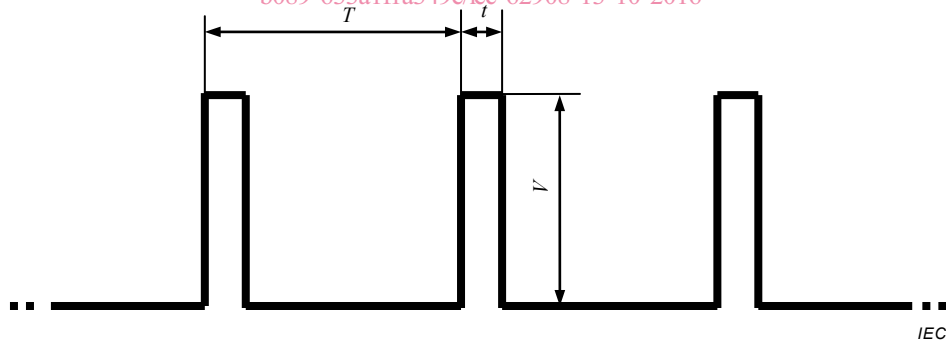


Figure 1 – Example setup of test pattern cell
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NOTE V is the voltage of the applied pulse wave, T is the period, and t is the pulse duration. The duty ratio percent is calculated by $t/T \times 100$.

Figure 2 – Example of applied pulse wave for the test

4.6 Number of duplicates and reference touch display module

At least three duplicates of the touch display module should be prepared. It shall be confirmed that the performance of all three touch display modules is the same or within the required precise evaluation. One of the three shall be retained as the reference touch display module. The reference touch display module shall be stored under standard ambient conditions or controlled conditions where no change in the performance of the touch display module occurs.