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INTERNATIONAL STANDARD

LED modules - Safety requirements

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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IEC 62031 has been prepared by subcommittee 34A: Electric light sources, of IEC technical committee 34: Lighting. It is an International Standard.

This third edition cancels and replaces the second edition published in 2018. This edition constitutes a technical revision.

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

a) Complete review of the document structure, detailed technical requirements and tests, including but not limited to what is individually described under items b) to i);
b) Clarification of the scope and revision of the applicability of this document to independent and integral LED modules;
c) Updated terms and definitions;
d) Clearer specification for clause general requirements and clause general test requirements;
e) Update of the marking clause, such as marking of control terminals;

f) A full review and update of the electrical safety, thermal safety, and mechanical safety requirements preventing misinterpretation and ambiguity;

g) Updated photobiological safety requirements;

h) Revised and updated fault conditions and abnormal conditions requirements;

i) Removal of the annex relating to conformity testing during manufacture.

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

Draft	Report on voting
34A/2464/FDIS	34A/2467/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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

– reconfirmed,

– withdrawn, or

– revised.

1 Scope

This document specifies safety requirements for LED modules for operation on DC supplies up to 1 500 V or on AC supplies up to 1 000 V. This document does not include requirements for performance characteristics of LED modules.

This document does not apply to:

– LED packages;
– LED modules for automotive lighting;
– OLED modules;
– LED lamps.

NOTE 1 Products that were designated as "independent LED modules" in the previous edition of IEC 62031 are considered luminaires which comprise LED module(s) as an integral component.

NOTE 2 Requirements for LED modules that are an integral component of the luminaire are specified in IEC 60598-1:2024. IEC 60598-1:2024, 4.3.1, makes reference back to this document as far as reasonable.

NOTE 3 Where the word "LED module" is used in this document, it is understood to be "built-in LED module".

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 60384-14:2023, *Fixed capacitors for use in electronic equipment - Part 14: Sectional specification - Fixed capacitors for electromagnetic interference suppression and connection to the supply mains*
IEC 60384-14:2023/AMD1:2025

IEC 60417, *Graphical symbols for use on equipment*, available at http://www.graphical-symbols.info/equipment

IEC 60598-1:2024, *Luminaires - Part 1: General requirements and tests*

IEC 60695-2-10:2021, *Fire hazard testing - Part 2-10: Glowing/hot-wire based test methods - Glow-wire apparatus and common test procedure*

IEC 60695-2-11:2021, *Fire hazard testing - Part 2-11: Glowing/hot-wire based test methods - Glow-wire flammability test method for end products (GWEPT)*

IEC 60695-11-5:2016, *Fire hazard testing - Part 11-5: Test flames - Needle-flame test method - Apparatus, confirmatory test arrangement and guidance*

IEC 60990:2016, *Methods of measurement of touch current and protective conductor current*

IEC 61032:1997, *Protection of persons and equipment by enclosures - Probes for verification*

IEC 61347-1:2024, *Controlgear for electric light sources - Safety - Part 1: General requirements*

IEC 61189-2:2006, *Test methods for electrical materials, printed boards and other interconnection structures and assemblies - Part 2: Test methods for materials for interconnection structures*

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IEC 60050-151:2001, *International Electrotechnical Vocabulary (IEV) - Part 151: Electrical and magnetic devices* (available at http://www.electropedia.org)

IEC 60050-551:1998, *International Electrotechnical Vocabulary (IEV) - Part 551: Power electronics* (available at http://www.electropedia.org)

IEC 60050-845:2020, *International Electrotechnical Vocabulary (IEV) - Part 845: Lighting* (available at http://www.electropedia.org)

IEC 60364 (all parts), *Low-voltage electrical installations*

IEC 60364-4-41:2005, *Low-voltage electrical installations - Part 4-41: Protection for safety - Protection against electric shock*

IEC 60747-5-5, *Semiconductor devices - Part 5-5: Optoelectronic devices - Photocouplers*

IEC 60838-2-2, *Miscellaneous lampholders - Part 2-2: Particular requirements - Connectors for LED-modules*

IEC 60947-7-4, *Low-voltage switchgear and controlgear - Part 7-4: Ancillary equipment - PCB terminal blocks for copper conductors*

IEC 60998 (all parts), *Connecting devices for low-voltage circuits for household and similar purposes*

IEC 61140:2016, *Protection against electric shock - Common aspects for installations and equipment*

IEC 61180:2016, *High-voltage test techniques for low-voltage equipment - Definitions, test and procedure requirements, test equipment*

IEC 61347-2-13:2024, *Controlgear for electric light sources - Safety - Part 2-13: Particular requirements - Electronic controlgear for LED light sources*

IEC 62386 (all parts), *Digital addressable lighting interface*

IEC 62471:2006, *Photobiological safety of lamps and lamp systems*

IEC TR 63139:2018, *Explanation of the mathematical addition of working voltages, insulation between circuits and use of PELV in TC 34 standards*

IEC 63356-1:2023, *LED light source characteristics - Part 1: Data sheets*

IEC 63356-2:2024, *LED light source characteristics - Part 2: Design parameters and values*

ANSI E1.11-2024, *Entertainment Technology - USITT DMX512-A, Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories*

KOUWENHOVEN, W.B. et al, *Electric Shock Effects of Frequency* (1936)