PRE-RELEASE VERSION (FDIS)

Semiconductor devices –
Part 5-6: Optoelectronic devices – Light emitting diodes

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**IEC SC 47E : DISCRETE SEMICONDUCTOR DEVICES**

**SECRETARIAT:**
Korea, Republic of

**SECRETARY:**
Mr Hojun Ryu

**OF INTEREST TO THE FOLLOWING COMMITTEES:**
SC 34A

**HORIZONTAL STANDARD:**
☐

**FUNCTIONS CONCERNED:**

- ☐ EMC
- ☐ ENVIRONMENT
- ☐ QUALITY ASSURANCE
- ☐ SAFETY

- ☐ SUBMITTED FOR CENELEC PARALLEL VOTING
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Semiconductor devices - Part 5-6: Optoelectronic devices - Light emitting diodes

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**NOTE FROM TC/SC OFFICERS:**
This draft was discussed and approved at the online meeting of WG 9 and SC 47E in November 2020.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SEMICONDUCTOR DEVICES –
Part 5-6: Optoelectronic devices – Light emitting diodes

FOREWORD

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IEC 60747-5-6 has been prepared by subcommittee 47E: Discrete semiconductor devices, of IEC technical committee 47: Semiconductor devices. It is an International Standard.

This second edition cancels and replaces the first edition published in 2016. This edition constitutes a technical revision.

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

a) ultraviolet-emitting diodes (UV LED) and their related technical contents were added;

b) power efficiency ($\eta_{PE}$) as part of electrical and optical characteristics were added;

c) new measuring methods related to thermal resistance were added;

d) hydrogen sulphide corrosion test was added to quality evaluation;

e) some standards were added to the bibliography.
The text of this International Standard is based on the following documents:

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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/standardsdev/publications.

A list of all parts in the IEC 60747 series, published under the general title Semiconductor devices, 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 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
- amended.
1 Scope

This part of IEC 60747 specifies the terminology, the essential ratings and characteristics, the measuring methods and the quality evaluations of light emitting diodes (LEDs) for general industrial applications such as signals, controllers, sensors, etc.

LEDs for lighting applications are out of the scope of this part of IEC 60747.

LEDs are classified as follows:

a) LED package;
b) LED flat illuminator;
c) LED numeric display and alpha-numeric display;
d) LED dot-matrix display;
e) infrared-emitting diode (IR LED);
f) ultraviolet-emitting diode (UV LED).

LEDs with a heat spreader or having a terminal geometry that performs the function of a heat spreader are within the scope of this part of IEC 60747.

An integration of LEDs and controlgears, integrated LED modules, semi-integrated LED modules, integrated LED lamps or semi-integrated LED lamps, are out of the scope of this part of IEC 60747.

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 60051 (all parts), Direct acting indicating analogue electrical measuring instruments and their accessories

IEC 60068-2-17, Basic environmental testing procedures – Part 2-17: Tests – Test Q: Sealing

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


IEC 60749-6, Semiconductor devices – Mechanical and climatic test methods – Part 6: Storage at high temperature

IEC 60749-10, Semiconductor devices – Mechanical and climatic test methods – Part 10: Mechanical shock
IEC 60749-12, Semiconductor devices – Mechanical and climatic test methods – Part 12: Vibration, variable frequency

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

IEC 60749-15, Semiconductor devices – Mechanical and climatic test methods – Part 15: Resistance to soldering temperature for through-hole mounted devices

IEC 60749-20, Semiconductor devices – Mechanical and climatic test methods – Part 20: Resistance of plastic encapsulated SMDs to the combined effect of moisture and soldering heat

IEC 60749-21, Semiconductor devices – Mechanical and climatic test methods – Part 21: Solderability

IEC 60749-24, Semiconductor devices – Mechanical and climatic test methods – Part 24: Accelerated moisture resistance – Unbiased HAST

IEC 60749-25, Semiconductor devices – Mechanical and climatic test methods – Part 25: Temperature cycling

IEC 60749-36, Semiconductor devices – Mechanical and climatic test methods – Part 36: Acceleration, steady state

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