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INTERNATIONAL STANDARD

colour inside

Semiconductor devices –
Part 5-15: Optoelectronic devices – Light emitting diodes – Test method of the flat-band voltage based on the electroreflectance spectroscopy

IEC 60747-5-15:2022 (en)

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Part 5-15: Optoelectronic devices – Light emitting diodes – Test method of the flat-band voltage based on the electroreflectance spectroscopy

FOREWORD

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IEC 60747-5-15 has been prepared by subcommittee 47E: Discrete semiconductor devices, of IEC technical committee 47: Semiconductor devices. It is an International Standard.

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

Draft	Report on voting
47E/737A/CDV	47E/764A/RVC

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.

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- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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SEMICONDUCTOR DEVICES –

Part 5-15: Optoelectronic devices – Light emitting diodes – Test method of the flat-band voltage based on the electroreflectance spectroscopy

1 Scope

This part of IEC 60747-5 specifies the measuring methods of flat-band voltage of single GaN-based light emitting diode (LED) die or package without phosphor, based on the electroreflectance (ER) spectroscopy. White LEDs for lighting applications are out of the scope of this part of IEC 60747-5.

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 60747-5-6:2021, *Semiconductor devices – Part 5-6: Optoelectronic devices – Light emitting diodes*

3 Terms, definitions and abbreviated terms

For the purposes of this document, the following terms and definitions 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

3.1 Terms and definitions

3.1.1
spectral reflectance
$R(\lambda)$
ratio of reflected radiant flux to incident radiant flux for a wavelength λ

Note 1 to entry: Spectral reflectance is also known as the "spectral reflection factor".

[SOURCE: IEC 60747-5-6:2021, 3.1.8]

3.1.2
flat-band voltage
V_{FB}
voltage at which the mean electric field across the wells can be considered to be zero

3.1.3
built-in voltage
V_{bi}
voltage built into the pn junction of the LED when no external voltage is applied