BS IEC 60747-5-9:2019

BSI Standards Publication

Semiconductor devices

Part 5-9: Optoelectronic devices — Light emitting diodes — Test method of the internal quantum efficiency based on the temperature-dependent electroluminescence

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National foreword

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Semiconductor devices –
Part 5-9: Optoelectronic devices – Light emitting diodes – Test method of the internal quantum efficiency based on the temperature-dependent electroluminescence

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SEMICONDUCTOR DEVICES –

Part 5-9: Optoelectronic devices – Light emitting diodes – Test method of the internal quantum efficiency based on the temperature-dependent electroluminescence

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

CDV	Report on voting
47E/651/CDV	47E/676/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.

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Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

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SEMICONDUCTOR DEVICES –

Part 5-9: Optoelectronic devices – Light emitting diodes – Test method of the internal quantum efficiency based on the temperature-dependent electroluminescence

1 Scope

This part of IEC 60747 specifies the measuring method of the internal quantum efficiency (IQE) of single light emitting diode (LED) chips or packages without phosphor. White LEDs for lighting applications are out of the scope of this document. This document utilizes the relative external quantum efficiencies (EQEs) measured at cryogenic temperatures and at an operating temperature, which is called temperature-dependent electroluminescence (TDEL). In order to identify the reference IQE of 100 %, the maximum values of the peak EQE are found by varying the environmental temperature and current.

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 60747-5-6:2016, *Semiconductor devices – Part 5-6: Optoelectronic devices – Light emitting diodes*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

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

3.1.1
radiant power
Φ_e
power emitted, transmitted or received in the form of radiation

Note 1 to entry: The unit used is: W. Radiant power is also known as the "radiant flux".

[SOURCE: IEC 60747-5-8:2019, 3.1.1]

3.1.2
internal quantum efficiency
η_{IQE}
ratio of the number of photons emitted from the active region per unit time to the number of electrons injected into the LED per unit time

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