

# INTERNATIONAL STANDARD



**Semiconductor devices –  
Part 5-14: Optoelectronic devices – Light emitting diodes – Test method of the  
surface temperature based on the thermorefectance method**



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**Part 5-14: Optoelectronic devices – Light emitting diodes – Test method of the surface temperature based on the thermorefectance method**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

ICS 31.080.99

ISBN 978-2-8322-1085-1

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## SEMICONDUCTOR DEVICES –

**Part 5-14: Optoelectronic devices – Light emitting diodes –  
Test method of the surface temperature based on  
the thermoreflectance method**

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

Draft	Report on voting
47E/773/FDIS	47E/784/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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

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## SEMICONDUCTOR DEVICES –

### Part 5-14: Optoelectronic devices – Light emitting diodes – Test method of the surface temperature based on the thermoreflectance method

#### 1 Scope

This part of IEC 60747-5 specifies the measuring method of the surface temperature of single LED die or package, based on the thermoreflectance (TR) method. TR is the effect that the reflectance of light changes with the temperature of a substance. This part measures relative change in the reflectance of light from a metal film deposited nearby on the metallurgical pn junction as the relative change in the LED junction temperature. The surface temperature can be approximated as the junction temperature when the thermal resistance effect between the metal surface and the pn junction is negligibly small.

#### 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 terms and definitions given in IEC 60747-5-6 and the following 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

###### sample

measurement object consisting of an LED die and a metal (or any reflective) film formed on the surface of the LED die or package

###### 3.1.2

###### ambient temperature

$T_a$

temperature at or near the metal film specified for the purpose of the TR method