PD IEC TR 61292-3:2020

BSI Standards Publication

# Optical amplifiers

Part 3: Classification, characteristics and applications



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# National foreword

This Published Document is the UK implementation of IEC TR 61292-3:2020. It supersedes PD IEC TR 61292-3:2003, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GEL/86/3, Fibre optic systems and active devices.

A list of organizations represented on this committee can be obtained on request to its secretary.

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# IEC TR 61292-3

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# TECHNICAL REPORT


## Optical amplifiers –
## Part 3: Classification, characteristics and applications

INTERNATIONAL
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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# OPTICAL AMPLIFIERS –

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## FOREWORD

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IEC TR 61292-3, which is a technical report, has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

This second edition cancels and replaces the first edition published in 2003. This edition constitutes a technical revision.

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

a) document architecture now focuses on EDFA, FRA and SOA;
b) the description of PDFA and TDFA has been moved to the annexes;
c) the EDWA description has been deleted;

d) information on single channel amplification, multi-channel amplification, configuration and control method for EDFA, FRA and SOA has been added;

e) information on future amplifiers, arrayed amplifiers and SDM amplifiers has been added.

The text of this document is based on the following documents:

| Draft TR | Report on voting |
|---|---|
| 86C/1597/DTR | 86C/1630/RVDTR |

Full information on the voting for the approval of this document 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.

A list of all parts in the IEC 61292 series, published under the general title *Optical amplifiers*, 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 "http://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.

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# OPTICAL AMPLIFIERS –

# Part 3: Classification, characteristics and applications

## 1 Scope

This part of IEC 61292, which is a Technical Report, establishes the classification of optical amplifiers (OAs). It also includes a brief description of each amplifier, its general properties, performance, configurations and applications.

## 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 60050-731, *International Electrotechnical Vocabulary – Part 731: Optical fibre communication* (available at www.electropedia.org)

IEC 61291-1, *Optical amplifiers – Part 1: Generic specification*

IEC TR 61931, *Fibre optic – Terminology*

## 3 Terms, definitions and abbreviated terms

### 3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-731, IEC 61291-1, IEC TR 61931, 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

**3.1.1**
**erbium-doped fibre amplifier**
**EDFA**
rare earth-doped fibre amplifier, where the core of the fibre is doped with erbium ions

**3.1.2**
**semiconductor optical amplifier**
**SOA**
optical amplifier that uses a semiconductor to provide the gain medium

Note 1 to entry: These amplifiers have a similar structure to Fabry-Pérot laser diodes but with anti-reflection design elements at the end faces. The signal is amplified through the stimulated emission phenomenon of gain medium.

**3.1.3**
**single channel amplifier**
optical amplifier amplifying one signal