



BSI Standards Publication

## Optical amplifiers

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Part 1: Parameters of optical fibre amplifier components

## National foreword

This Published Document is the UK implementation of IEC TR 61292-1:2022. It supersedes PD IEC/TR 61292-1:2009, which is withdrawn.

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

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## TECHNICAL REPORT

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**Optical amplifiers –  
Part 1: Parameters of optical fibre amplifier components**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## OPTICAL AMPLIFIERS –

## Part 1: Parameters of optical fibre amplifier components

## FOREWORD

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IEC TR 61292-1 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics. It is a Technical Report.

This third edition cancels and replaces the second edition published in 2009. This edition constitutes a technical revision.

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

- a) Change of document title from "Parameters of amplifier components" to "Parameters of optical fibre amplifier components";
- b) Addition of parameters for optical components used in fibre Raman amplifiers;
- c) Addition of Table 1, listing various documents that specify terms and definitions for optical components used in optical fibre amplifiers;
- d) Addition of Figure 2 and Figure 3, showing typical component layouts for distributed and lumped fibre Raman amplifiers;

- e) Harmonization of the descriptions of optical component parameters with the definitions in other standards on optical components.

The text of this Technical Report is based on the following documents:

Draft	Report on voting
86C/1775/DTR	86C/1784/RVDTR

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 Technical Report is English.

A list of all parts of the IEC 61292 series, published under the general title *Optical amplifiers*, can be found on the IEC website.

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/publications](http://www.iec.ch/publications).

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](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.

## OPTICAL AMPLIFIERS –

### Part 1: Parameters of optical fibre amplifier components

#### 1 Scope

This part of IEC 61292, which is a Technical Report, applies to optical components of optical fibre amplifiers (OFAs). This document provides information about the most relevant parameters of these optical components, especially for erbium doped fibre amplifiers (EDFAs) and fibre Raman amplifiers (FRAs). It provides introductory information for a better understanding operation and applications of EDFAs and FRAs.

NOTE IEC TR 61292-6 provides more technical information on FRAs.

#### 2 Normative references

The following documents are referred to in the text in such a way that none 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 61291-1:2018, *Fibre amplifiers – Generic specification*

IEC TR 61931, *Fibre optic – Terminology*

#### 3 Terms, definitions, abbreviated terms and symbols

##### 3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61291-1, IEC TR 61931, and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

##### 3.1.1 Parameters for active fibres

###### 3.1.1.1

###### maximum input signal power

<active fibres> maximum power of the input signal above which the active fibre gets damaged, causing impossibility of normal operation for a given active fibre

###### 3.1.1.2

###### insertion loss at out-of-band wavelength

<active fibres> insertion loss for a signal at the specified out-of-band wavelength(s) for a given active fibre

Note 1 to entry: IEC 61290-7-1 defines the measurement procedure of out-of-band insertion loss.

[SOURCE: IEC 61291-1:2018, 3.2.1.59, modified – Term changed from "out-of-band insertion loss", the specific use "active fibres" has been added, and Note 1 to entry has been added.]